THE IRON TRADE REVIEW

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Prevailing Sentiment Shows Some Improvement

On Account of Great Consumption Being Continued—Pig Iron Prices Sag and Blowing Out of More Furnaces is Expected

Tremendous consumption of the products of furnaces, foundries and finishing mills is still strongly contrasted with the very small volume of buying. Veteran observers say that this condition is more striking than at any period in their recollection. There must soon be considerable new business if the present rate of consumption continues. The ordering may, however, be for prompt delivery only until it becomes more apparent whether the new tariff and other conditions will seriously interfere with business during the second half of the year.

Prevailing sentiment in the finished material market has improved and there is increasing confidence that with heavy order books, liberal specifying and absence of cancellations, there will soon be a turn for the better. In track work, manufacturers are estimating upon an unprecedented amount of business. While agricultural implement makers still hesitate, a sale of 5,000 tons to the implement trade in Chicago has been made by the Illinois Steel Co. Scattered rail orders booked by the Corporation during the week reached 5,000 tons.

Crude Steel

More than 25,000 tons of Bessemer and open-hearth sheet bars have recently been sold at $27.50, mill, and pending inquiries involve about 21,000 tons, which can be obtained at about $27.50 for either prompt or forward delivery. In eastern territory, buying of billets is not very active, but there is an insistent demand for prompt delivery of tonnage under contract.

Pig Iron

Many foundries are so busy that they have requested anticipation of shipments and some have already received all that is due them on contracts up to July 1. Hence it is clear that unless there should be a very sudden reduction in melt, buying of foundry iron will soon be absolutely necessary. It is also believed that users of steel-making irons cannot much longer remain out of the market. The Tennessee Coal, Iron & Railroad Co. reports sales of about 25,000 tons, largely of foundry grades, including some export business. Shipments are now being made to Brazil, which offers a new market on account of the new gulf line boats. Leading makers still quote $12 for No. 2 foundry, Birmingham, but an increasing tonnage is available at $11.50 to $11.75, and the southern market is weak. The purchase of 3,000 tons of basic by the American Steel Foundries for June-July, is taken as indication that this leading company in its line is melting a heavier tonnage than it estimated. On the other hand, the attitude of the Westinghouse Electric & Mfg. Co., which has been in the market for about two weeks, has had a rather depressing effect. This company, which was expected to buy from 15,000 to 20,000 tons of foundry grades, found the market soft and prices gradually declining, and is understood to be awaiting a quotation of $14, valley, for No. 2. This price may be made, but some furnaces will blow out in the central west, as a number have already done in eastern territory, rather than make further concessions.

Plates

The Carnegie Steel Co. will furnish 5,000 tons of material for the Canadian boat, which is to be built at the Port Arthur plant of the American Shipbuilding Co. The Lukens Iron & Steel Co. was the low bidder on about 5,000 tons of plates for the two colliers, Maumee and Kanawha. Attempts of buyers of plates in eastern territory to obtain concessions on plates of $2 a ton have been unsuccessful.

Exports

Southern furnaces have been selling pig iron for export at $11.50 for No. 2, and there is still some inquiry. German consumers of iron ore are still showing an interest in the possibility of making a term contract for 60,000 tons of high grade American ores, preferably Bessemer, running 55 to 60 per cent. On account of the long haul, it is not expected that the Superior ores could be sold for export to Germany, but Cuban ore might be used to meet the requirements.

Railroad Buying

Railroads are buying in a moderate way and the tonnage of bridge work pending is between 10,000 and 12,000. Pending inquiries for rails for export amount to about 60,000 tons, including 45,000 tons for a Cuban line.

"Gentle Peace in One Hand, War in the Other"

Was the Advice of Andrew Carnegie in Dealing With One Competitor

Interesting Details of the Rail Trade and How it Was Controlled

Charles M. Schwab, formerly president of the Carnegie Steel Co. and the United States Steel Corporation, continued on the stand at Tuesday's hearing in New York City, of the Steel Corporation suit. The report of Mr. Schwab's direct testimony the previous day appears elsewhere in this issue. He began his testimony under questioning by Judge Dickinson by telling of the various rail and other "pools"; also about the process of destructive competition which followed the breaking up of "pools" from time to time. He also described the evolution of the steel business and how in the late '90's manufacturers of semi-finished lines found they were losing their markets, and how they realized they would have to consume their own semi-finished materials by going into further manufacture of finished lines.

President Schwab freely related the details involved in steel rail competition, but could not remember each "pool" separately as there were so many, he said. The main rail makers of the country were the Illinois and Carnegie Steel companies, and these dominated the various rail "pools." Generally there was a "pool" within a "pool"—between all the rail makers and between the Carnegie and the Illinois companies. As a rule, these two active concerns divided up equally the total tonnage which they booked, although the Illinois company generally got more orders than the Carnegie company. When they broke up an agreement there always followed a period of destructive competition, each selling into the territory of the other, also into the territory of all others, regardless of price or freight.

Allotments Juggled

There was a great deal of juggling among "pool" members as to allotments. One time the Maryland Steel Co. was paid $250,000 by the other makers to stop producing for one year. Sparrow's Point, Md., Harrisburg, Pa., and Scranton, Pa., were sore spots to Andrew Carnegie, and in one letter he expressed himself as disappointed that they had not been put out of the rail business in the preceding year of low prices. He favored making arrangements for another year with these concerns, he wrote, as high prices promised to rule, but he said his view was that sooner or later they, like the Bethlehem Steel Co., would cease making rails.

The Empire Rail Co., which was to be organized in November, 1898, for pooling sales and regulating the production of all manufactures in the country, fell through at the last moment because of Andrew Carnegie's objection. He refused to join it on the ground that it would become unpopular as a so-called "trust". He suggested that it would be better to form an agrement with the Federal Steel Co. for an equal division of their business. This was done, Cambria Steel and Colorado Fuel & Iron companies also being taken into the agreement.

Made Easy Money

In 1899 the Carnegie company equipped a mill for making girder rails, spending $61,000 for the rolls. It agreed to refrain from making girder rails, however, upon the payment of a consideration of $100,000 per year by the other manufacturers. President Schwab explained that the Carnegie company had not intended to make these rails, but was merely "putting up a front" to get the payment of the money to stay out of the market. It was worth it, he said.

In dull times the Carnegie policy was to take the orders. The pace got too hot for the other concerns and they dropped out one after another, as their production costs were higher. Even in the severest price-cutting period, the Carnegie company averaged a profit of $4 a ton on the total business.

Judge Dickinson read an extract from the company's minutes of 1897 showing that the Illinois Steel Co. had consented to take foreign, and especially the Canadian, rail business out of the agreement. He also read an extract telling of a meeting of English rail makers early in 1898 at which it was agreed to offer the American makers 100,000 tons of Canadian and foreign rail business a year if they would agree to keep out of the foreign market otherwise. President Schwab advised them this allotment was entirely too small and was not to be considered.

Judge Dickinson read from a letter written by Andrew Carnegie on Jan. 3, 1899, in which he said:

"The wisest articles I read are those of The Iron Trade Review, of Cleveland. Would you kindly read to the board the parts blue penciled enclosed?"

Peace and War.

In another letter Carnegie advised how to deal with the American Tin Plate Co. He quoted Shakespeare, the purpose being that the Carnegie company should offer the Tin Plate company "gentle peace in one hand and war in the other". In case of war, he advised against "gentle" war. The larger those "trusts" were, he said, the more vulnerable they become, and the Carnegie company's attitude should be one of independence.

In a letter received from Andrew Carnegie in 1900, he advised that the company get the American Steel Hoop Co. to buy more than 3,000 tons of billets each month, and if it did not buy more, Carnegie would go into the hoop business. In the same year the American Steel & Wire Co. canceled its contracts with the Carnegie company for its raw material supplies, and Andrew Carnegie advised his associates to go ahead with the construction of mills for making hoop and wire products, and on July 16 it was voted to expend $1,400,000 for a rod, wire and rail plant at Duquesne, Pa. Andrew Carnegie wrote and said: "Trouble is coming just as was expected."

Glad Mills Were Non-Union.

He was glad, he said, that the Carnegie company was operating non-union, as that was a big advantage. He also talked about going into the hoop, tube and other lines later. At a meeting in October, President Schwab reported on a talk he had had with Mr. Steele, of J. P. Morgan & Co. The latter was worried because of the report that the Carnegie company was going to make tubes. Judge Dickinson read from THE IRON TRADE REVIEW of Jan 10, 1901, an article entitled "Great Carnegie Tube Works at Conneaut." Charles M. Schwab said this report was written on an announcement made by him to the representative of THE IRON TRADE REVIEW, and was reliable.

VALLEY RATES

On Ore, Coke and Coal Argued Before Commission—Case Submitted.

Arguments were made May 20, before the Interstate Commerce Commission in the cases of the Youngstown Sheet & Tube Co., and other independent steel concerns of the Mahoning and Shenango valleys against the Pittsburgh & Lake Erie, the Lake Shore & Michigan Southern and other railroads on coal, coke and ore freight rates.

Attorney William A. Rand, representing the Youngstown Sheet & Tube Co., opening the argument, said the railroad had not emphasized the ton-mile return because they thought the car and train miles more important. He declared it indisputable that ore coke rates are unduly disproportionate. Strong attack was made on the payment of 11 cents per gross ton by the railroads to lower lake port stevedores for handling ore from the vessel over the docks as being useless, and representing nearly $300,000 per year, there having been 25,000,000 tons of ore taken out of Lake Erie docks in 1912. Under present arrangement, he said, shippers get no drawback, and the docks are owned by the railroads, shippers having no financial interest in them.

In replying, Attorney Butterfield, New York Central Lines, said a reduction of 10 cents on all rates would cost carriers $10,000,000 a year and no reduction could be made in operating expense. The complainants, he said, are "now trembling lest they shall be subjected to a major operation from which they might not survive." The idea had been exploded that cars in service are loaded in both directions and that coal had been carried in trainloads, he declared. He also upheld the payment made to stevedores, saying expert operation is required.

He said he believed the unloading charge of 10 cents for lifting ore from the hold of the vessel is not within the commission's jurisdiction. He went into detail on the charges of 56 and 64 cents for "direct" and "dock ore", from Lake Erie points to furnaces, the 70-cent rate on coal from Pittsburgh and the 90-cent rate on coke from Connellsville, Pa., to which the complainants are objecting, and in review of testimony offered, attempted to justify the rates. He said Mr. Muller had testified that the constructive rate on coal was 46 cents and that the roads had shown a cost of 71 cents, 1 cent higher than is actually charged. Switching movements required, distances and other items were brought into his argument to maintain the position of the carriers. The Bessemer & Lake Erie joint through rate contract was held to be no criterion of the reasonableness of the rate.

Referring to the claim that complainants are at the mercy of the railroads, Mr. Butterfield elaborated on what he called the building up of the valleys into flourishing industrial centers, of the thriving steel companies. In closing he said:

"And yet the Youngstown Sheet & Tube Co., the proudest lily of the valleys, arrayed in a brand new stock dividend of $5,000,000, which by itself is more than eight times the original capital of the corporation, comes here with its associates to say that they are at our mercy. Well, if this be the quality of mercy, we may as well say the Rose of Sharon is at the mercy of the sun."

Means Big Loss.

Attorney Taylor for the Erie said the Erie has docks only at Cleveland, and a reduction of 10 cents in ore transportation would mean a loss to the railroad of $100,000 annually, based on the 1,000,000 tons handled in 1911, for the valleys, and a loss of $125,000 on the 1,250,000 tons in 1912. He differed with Mr. Rand in computing the cost, which he said had been applied to the entire system, instead of the line from Cleveland to the valleys. Not having storage docks, he said, the Erie has to load ore into trains at Cleveland, store it at North Randall, and re-ship from there.

Rates on ore are not out of harmony with other commodities, according to Attorney Parker, representing the B. & O. He pointed out it is a question of cost, which, he said, for the B. & O., is higher than the revenue it gets. The ore dock cost at Lorain, O., was placed at 28 cents per ton, and the ore dock expense only $50,000 per year.

Proposed Advance Postponed

Washington, May 20.—The Interstate Commerce Commission has suspended from May 15, until Sept. 12, the proposed advances in railroad rates on shipments of structural iron and steel stopped in transit for fabrication at points throughout Central Freight Association territory, excepting certain points in Illinois. It was proposed to increase the tariffs from 1½ to 2½ cents per 100 pounds. Some of the fabrication points affected are Zanesville, Toledo, Columbus, and Mt. Vernon, O., Muncie, Ind., and Buffalo.

MEETING A. S. M. E.

At Baltimore—Many Interesting Papers—Plants Visited.

Baltimore, May 21. (By wire.)—The spring meeting of the American Society of Mechanical Engineers opened Tuesday for a four day session. There is a good attendance, including a fair representation of iron, steel and machinery industries. Particular interest is felt in the papers and discussions regarding the operation of gas engines on blast furnace gas, present conditions of the patent law, comparative costs of auto trucking, protection from belt drives and reduction of fire hazards.

Other subjects under consideration are change in membership grades and reports by committees on electric units, involute gears, etc.

The inspection of plants arranged by the local engineers' club, includes the works of the Maryland Steel Co. at Sparrows Point. Features of interest included the reconstruction of blast furnaces, the new Koppers coke ovens, building of steel ships and the transmission of hydro-electric power from the Susquehanna river, 40 miles distant. Visits will also include the inspection of the Maryland Car Wheel works, Maryland Car Wheel & Foundry Co., the Baltimore & Ohio railroad shops, Poole Engineering & Machinery Co., Skinner Shipbuilding & Dry Dock Co., Detrick & Harvey Machine Co., Baltimore Copper Rolling & Refining Co. and fertilizer plants utilizing sulphur from iron pyrites. The municipal high pressure pumping station will be visited and a demonstration given of throwing water over high buildings. Sewerage plants will also be inspected.

The meeting ends Friday with an all-day visit to the Naval Academy at Annapolis and inspection of the experiment station. Delegates will be shown results of tests of corrosion, strength of materials, endurance of metals, action of oil and coal fuel under boilers, steam turbines and other details of marine power plant operation. The academy buildings, shops and naval vessels will also be inspected.

Saturday some delegates will visit McCall's ferry plant and the bureau of standards at Washington.

The enrollment for the European trip of the A. S. M. E. is nearly complete, as only seven more reservations are to be made.

W. A. Myler, of Pittsburgh, at a recent meeting of the directors, was elected vice president of the Standard Chain Co., to succeed Robert Garland, resigned.

Lower Pig Iron Quotations Made at Pittsburgh

American Steel Foundries Buys Basic—Sale of Bessemer—General Sentiment of Market Improves

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg.,
Pittsburgh, May 20.

Prices of most products are somewhat lower, but manufacturers appear more optimistic than a fortnight ago. The various markets show signs of activity, but fancy prices no longer rule. Generally speaking, shipments are steadily improving, although several mills state that specifications last week were heavier than those for the preceding six-day period.

Pig Iron.—Lower prices have come out on all grades of pig iron except Bessemer. The American Steel Foundries has closed for 3,000 tons of basic for plants at Sharon, Pa., and Alliance, O., at about $14.75, valley, and the Standard Sanitary Mfg. Co. has purchased 500 tons of foundry at $14.50, valley. A Bessemer consumer has bought about 5,000 tons a month for second half shipment, the price of which will be determined by the monthly Bessemer averages, which are based on actual sales. The last Bessemer sale of consequence was made at $17, valley, but that figure now is nominal. Some blast furnaces representatives estimate that nearly 80 per cent of the furnace capacity is yet to be sold for second half delivery, and a heavy buying movement is expected.

Ferro-Alloys. — Lower prices continue in the east and similar conditions would prevail here if there were any buying movement. Other alloys are firm but quiet.

Plates.—There is more of a tendency to sell at 1.45c for forward delivery although some mills continue to quote 1.50c and as high as 1.60c is being obtained for prompt shipment. Producers are gradually getting closer to consumers. However, two mills report that specifications last week equalled shipments.

Sheets.—Automobile manufacturers are covering needs for the year beginning Sept. 1. Tonnages involved this year will double those of last, it is roughly estimated. Blue annealed and black sheets continue firm, but galvanized products can be quoted from 3.40c to 3.50c. Specifying has been brisk. The American Sheet & Tin Plate Co. is operating 81 per cent of its sheet mills.

Tin Plate.—The market is quiet, but specifying continues heavy. There has not been much call for prompt material. The Corporation is operating 89 per cent of its tin plate capacity.

Rails and Track Material.—Attractive inquiries for steel rails are before the trade. Material involved will be used for line extensions. Demand for light rails has not fallen off and mills are well protected so far as the remainder of the year is concerned. Spikes are obtainable at 1.80c, although some makers refuse to shade 1.90c. Other track material is firm.

Billets and Sheet Bars.—More than 25,000 tons of Bessemer and open-hearth sheet bars have been sold within the last three weeks at $27.50, mill, and inquiries now pending involve about 21,000 tons of sheet bars, which can be obtained all the way from $27.50 to $28.50 for both prompt and forward delivery. Both Bessemer and open-hearth billets continue strong, but sellers and buyers agree they can be had at $27 to $27.50, mill. Talk of lower prices is heard, but it is impossible to verify reports of sales at lower figures.

Hoops and Bands.—Deliveries are three and four months deferred, but are slowly improving. There is no new business being experienced. The price of cotton ties has not yet been determined.

Merchant Bars.—Agricultural implement makers have not yet concluded purchases and a further buying movement is expected. Both steel and iron bars are firm at 1.40c and 1.70c, respectively. Shafting is being offered at $2, a ton less than the prevailing market price, although most makers are from 60 to 90 days deferred in shipments.

Muck Bar.—We continue to quote muck bar at $31 to $38, Pittsburgh, figures at which sales have been made this week.

Bolts, Nuts and Rivets.—Prices continue somewhat soft, although conditions in this district are better than those prevailing in adjoining territories. Shipments are steadily improving, although more important makers are unable to offer material for delivery in less than 60 days.

Structural Shapes.—Deliveries are somewhat better, although specifications thus far this month are heavier in several instances than those of the corresponding period in April. The 1.50c quotation for forward delivery is gradually disappearing. Inquiries are fairly heavy.

Iron and Steel Pipe.—No especially large orders have been taken this week. Mills are well filled up with contracts for line pipe, but are in fairly good condition to ship the smaller sizes. An inquiry for 30 miles of line pipe is before the trade.

Boiler Tubes.—Specifying continues fairly heavy, but it is not so brisk as it was a month ago. New buying has been light.

Wire.—The wire market is almost in the dumps. Specifying, some mills advise, is not so heavy as it was last week and new orders are not coming in with much snap. Shipment against contracts placed at lower prices than those prevailing has fallen off in some instances. Present-day prices are far from being well established.

Wire Rods.—Despite inactivity in the wire market, some of the leading manufacturers are not yet able to roll surplus tonnages of rods, which are quoted nominally at $30, Pittsburgh.

Coke. — The Zenith Furnace Co. has bought about 5,000 tons of prompt Connellsville coke for a stack at Duluth at what is reported to be from $2.15 to $2.25, ovens. The report that the Pittsburgh Steel Co. has covered second half requirements for one of its new stacks at Monessen cannot be confirmed. The New Jersey Zinc Co. has not yet closed for 10,000 tons a month for stacks at Hazard, Pa. Shippers are asking $2.50 for second half fuel and are obtaining from $2.15 to $2.25 for prompt coke. More than 150,000 tons of foundry fuel were sold last week at a range from $3 to $3.25 or about 80 cents a ton above prices obtained a year ago. The Connellsville *Courier* for the week ending May 10 reports production at 414,486 tons.

Old Material.—Prices continue weak and there are no indications of improvement. Consumers are not covering for forward requirements and fail to show interest in prevailing quotations. Heavy tonnages are being offered by small dealers. Prices of most grades are nominal.

Bar Specifications at Chicago Show Increase

And Some New Contracts Have Been Made—
Pig Iron Consumers Disposed to Buy Cautiously

Office of THE IRON TRADE REVIEW,
1521-23 Lytton Bldg.,
Chicago, May 20.

While new business has fallen off in this territory to considerable extent the decrease is far from being alarming. During the month of April figures gathered from mills in this territory show an average of new business and specifications running about 30 per cent in excess of productive capacity. One of the independent producers reports that its new business bookings during that period were about 50 per cent in excess of shipments. So far in May new orders are much lighter, but some business is pending, the closing of which will likely keep the average somewhat above capacity. Specifications are satisfactory in all lines, particularly in steel bars, for which they are considerably in excess of the April average. New business in this material is also good, due to the closing of some agricultural contracts. The larger agricultural interests are still uncovered owing to uncertainty as to how long their present booking will suffice. It is reasonably certain that the slackening of new orders is not due to any real lack of demand, but is caused by the condition of the money market. Bankers are disposed to assure themselves of their customers' ability to clean up on existing loans by requiring temporary liquidation, as they have for over a year been placing loans at an almost unprecedented rate.

Pig Iron.—The larger consumers in this territory evince a disposition to cover for their needs in the immediate future, but owing to the soft condition of both the northern and southern markets, will likely not buy for more than two or three months ahead. A large consumer of basic has taken 3,000 tons of that iron, for delivery in Ohio and Pennsylvania. The price is understood to be on a basis of about $14.75, valley. Production in this territory has unquestionably decreased somewhat, but not sufficiently to have any great effect on the market, the present weakness being due to the fact that prices have been largely in the buyers' hands for some time.

Owing to a scarcity of sales, prices on both northern and southern are nominal to a certain extent, except for prompt shipment. Some of the sellers in this locality report that they have lost small tonnages for prompt shipment offered at $12, Birmingham, on account of the buyers having a quotation said to be on a basis of $11.50. It is probable, however, that while this price may be made on some iron for prompt shipment on a cash basis, it is confined entirely to sales of that character, no furnaces being willing as yet to go below $12 for contract delivery over the second half. The bottom of the northern market seems to be $16, local furnaces. As in all other lines, the attitude of bankers toward further expenditures has been largely responsible for inactivity heretofore.

Merchant Bars.—The larger agricultural interests are still holding off on their yearly requirements. These buyers, however, specified heavily against existing contracts and will carry over considerable tonnage to the second half. Their reluctance to enter the market at present is due not so much to hopes of lower prices as to a desire to be certain how long this tonnage will last before contracting additional obligations. Specifications for both iron and steel bars are fair, the past week showing an increase over the previous one. In bar iron the mills have specifications sufficient to run for about 60 days. Large premiums for prompt delivery can no longer be obtained, but there is no indication of lower prices. In hard steel bars, mills are operating at capacity and the demand is about on par with that for other materials. The market remains at from 1.57½c to 1.62½c for bar iron and for soft steel bars.

Plates and Structurals.—The first two weeks in May have shown a decrease in both specifications and new business in these materials from the rate maintained during April. Consumers are even more insistent regarding deliveries than they were during the winter, although high premiums for prompt shipments are largely a thing of the past. In shapes, the large number of small jobs being booked by fabricators at present is causing a continuation of good demand and is keeping specifications up at a good rate. The minimum period for mill delivery on new business in both plates and shapes is in the neighborhood of four months and on the latter this delivery can be obtained but rarely. In consideration of the rate at which buying was maintained during the winter and the large amount of business on mill books, new orders are coming in at a rate that indicates very little reduction in consumption. The total of new orders booked in structurals is lighter than in plates, as consumers are contracted far ahead for their requirements. In both materials, however, buying is at a rate a great deal better than in the average year. Prices are firm at 1.63c to 1.68c for both plates and standard structural shapes.

Rails and Track Fastenings.—It is reported that one of the western roads has contracted for a good tonnage of track fastenings. In general, however, new business in this material is scarce and present quotations must be considered largely nominal. Rail specifications are heavy and buyers are very exacting concerning deliveries. An absence in activity in both rails and track fastenings is to be expected at this time of the year, as western roads have followed their customary practice of contracting for the entire year. This was done to even a greater extent this year than for some years previously as buyers who remained out of the market at the beginning of 1912 had great difficulty later in the year, in obtaining deliveries sufficient to cover their requirements.

Bolts, Nuts and Rivets.—There is no betterment in the market for structural rivets, although the large number of small jobs taken by fabricators had given makers some reason to hope for a better market. It is now thought that 1.90c, Cleveland, can be done and that 1.85c, Pittsburgh, is possible on very desirable tonnages. Bolts and nuts remain about the same and there is very little slackening in new business offered.

Sheets.—Reductions in the price of spelter continue to make a weak market for galvanized sheets. What effect the reduction in the price of sheet bars for delivery over the last half will have on this market as a whole is uncertain as yet, especially in view of the fact that sheet bars

for prompt delivery are selling at higher prices. There has been no change in the rate of production in this territory, the larger mills still finding ample use for their raw steel output in the manufacture of other lines.

Wire Products.—There is no noticeable change in this market, business in general continuing comparatively quiet. Producers feel that they are on the eve of a dull period which may extend through most of the summer. If crop conditions are unchanged, however, a revival is expected later in the year.

Merchant Pipe and Tubes.—The market for merchant pipe and tubes remains quiet, but business continues at a rate sufficient to keep the makers operating near capacity. The effect of the large increases in building operations causing a demand for plumbing supplies will probably be felt in the near future.

Cast Iron Pipe.—A few very small tonnages were placed last week, but nothing of any consequence has transpired. Pipe makers report that the larger municipalities have budgets prepared against the easing up of the money market that will permit them to place their securities on a satisfactory basis. Of the lots placed this week, the United States Cast Iron Pipe & Foundry Co. has taken 1,900 tons from Cincinnati, on which it was low bidder. The same maker has also taken 900 tons of water pipe from Port Huron, Mich., and 1,000 tons from Evansville, Ind.

Old Material.—Outside of some trading among dealers, practically no transactions were noted during the past week. Heavy reductions have been made on almost every item on the list due to low offers by dealers in the hope of inducing consumers to come into the market. The latter, however, being well supplied for 60 days ahead are not disposed to buy even at bargain prices. There seems to be little indication of a revival of activity in the scrap market for some time as railroad scrap is accumulating and none of the tonnage offered in recent lists has been disposed of. The only item on the list that shows any indication of strength is iron car axles, which are noticeably scarce.

At a meeting of the executive committee of the Republic Iron & Steel Co., held May 19, the regular quarterly dividend of 1¾ on the preferred stock was declared payable July 1, to stockholders of record, June 16.

Cleveland Fails to Sell Basic Pig Iron

Which is Taken by Pittsburgh Firm—Ice Still Retards Movement of Lake Vessels

Office of THE IRON TRADE REVIEW,
Penton Bldg.,
Cleveland, May 20.

Iron Ore.—Ice blown into the harbors at the head of the lakes has caused some embarrassment to vessels and there have been some other delays, so that the movement of the first 20 days of the month is hardly up to expectations. Ore shippers at the head of the lakes are having little difficulty in getting vessel tonnage, as a number of boats have gone up the lakes light in the past few days. Car shortage has reduced somewhat the movement of ore from the mines to shipping docks. Ice fields are still extensive on Lake Superior and vessels are compelled to move cautiously. The lake from Ontonagon to the Apostle Islands still abounds in ice and some pieces are large enough to be dangerous. This is a condition which has not existed for years.

Pig Iron.—Interest is centered in the recent purchase of the American Steel Foundries, and in the pending inquiry of the Westinghouse Electric & Mfg. Co. Cleveland agencies were not willing to name a price which was attractive to the Chicago buyer, which it is understood purchased 3,000 tons of basic at about $14.75, valley, for June-July delivery from a Pittsburgh firm. The Westinghouse company is understood to have had a price of $14.50 valley, for No. 2, but was not willing to pay more than $14. Local consumption continues without diminution. In numerous cases, foundries have requested anticipation of shipments and some of these consumers cannot long delay buying, for they must at least provide for early requirements. At present, however, there is practically no buying in Cleveland.

Coke. — Transactions are confined to very small lots of foundry grades which are sold at $3 to $3.25 on contract and little, if any, less for prompt delivery. Consumption by foundries shows no decrease.

Finished Material.—Mills report that if there has been any change during the past week, it is for the better in specifications and prevailing sentiment. Structural shops are busy and most of them in the city have enough work on hand to keep them employed for the next two or three months, but none of the important tonnages which have been pending have reached the contract stage. Agricultural implement makers are showing no anxiety to contract, although some have closed for their requirements up to January 1. Bar makers also are willing to wait. Less talk about cutting on sheets is heard and prices on black and blue annealed seem to be fairly well maintained. On open-hearth sheet bars the price seems to have settled to $27.50, Pittsburgh or Youngstown, for delivery any time within the next few months.

Old Material.—The scrap market continues to grow weaker and prices are easing off daily. Dealers are hastening to make deliveries on old contracts to avoid cancellations, while the supplies in the yards are growing rapidly. It is probable that there will be another recession in the price of heavy melting steel shortly. Of the two consumers of this scrap in the Cleveland district, one is out of the market altogether, while the other is bidding but $11.50. None of three consumers of busheling is in the market, and dealers are accumulating large stocks of which they are unable to dispose.

ST. LOUIS MARKET

Is Very Quiet—Sales of Malleable and Charcoal Iron.

Office of THE IRON TRADE REVIEW,
St. Louis, May 20.

Pig Iron.—Sales were made Friday of 1,000 tons of malleable to the Missouri Malleable Iron Co., of St. Louis, and 500 tons of charcoal iron to the Mt. Vernon Car Co., Mt. Vernon, Ill. Inquiry for pig iron in the St. Louis territory has dropped off to the minimum. Everybody seems to be playing a waiting game, the buying being under the impression that iron will go lower, while dealers are holding out for better prices.

No change has taken place in coke prices since last week, and the market is virtually devoid of interesting features.

The Steel Improvement Co., recently incorporated, has placed an order with the Beighlee Electric Co., Inc., Cleveland, for indicating and recording pyrometer equipment to be used in the heat treating department of the proposed plant of the new company.

Andrew Carnegie has given $150,000 for an extension to the Allegheny library at Pittsburgh.

Underlying Conditions Still Sound in the East

Buyers of Plates in Philadelphia District Fail to Obtain Desired Concessions—Pig Iron Very Dull

Office of THE IRON TRADE REVIEW,
611 Bulletin Bldg.,
Philadelphia, May 20.

New business in finished lines continues at a reduced volume and in most lines the practically premium prices which were obtained by eastern mills because of their shorter deliveries, have now receded to the level commonly quoted by large producers of the middle west. A leading exception to this decline is plates, in which eastern makers still quote 1.60c, Pittsburgh, to the regular trade though on a tonnage for government colliers for Pacific coast deliveries, prices of 1.50c and 1.55c, mill, were named. There is a dearth of sizeable orders in pig iron, buyers keeping to prompt delivery and prices are still falling away. Shipments continue good, but more furnaces are going out. The decline in old material prices is still unbroken.

Pig Iron.—There is no disposition shown by buyers to purchase more than their immediate requirements of iron, and the market has so narrowed that sales in the Eastern Pennsylvania district are now running but a very few thousand tons weekly. Where consumers are coming into the market, however, they are insistent for very prompt delivery, and this feature of the situation, fortified by the maintenance of a heavy shipping movement against old orders, suggests a continuance of sound underlying conditions. More furnaces are going out or are on the verge of doing so. The Pennsylvania Steel Co. has blown out its No. 3 Lebanon stack, which has been making basic, and the Tafton furnace will soon join the idle class. Prices generally are weak. Eastern Pennsylvania foundry is more freely offered at $16.75, Philadelphia and vicinity, for No. 2X, and some makers will go to $16.50 on desirable business. This is apparently the limit of the shading at this time and the full range of the market is from $16.50 to $17, delivered, or $16 to $16.25, eastern Pennsylvania furnace. Certain brands of No. 2X in the eastern Pennsylvania district have been sold as low as $15.55, furnace, for distant shipment, and central Pennsylvania makers ask $15 to $15.50, furnace, on this grade. A cast iron pipe maker has offered to take 15,000 tons of Southern Nos. 3 and 4 at $10, Birmingham, or about $14.25, delivered, but as this level is considerably below the market, it has been declined by the makers. A sale of 2,000 tons of southern Nos. 3 and 4 for early delivery to a pipe maker in this district at $15 to $15.25, delivered, is noted. Basic iron remains nominal in price at $16.50 delivered eastern Pennsylvania. How much this figure could be shaded would depend upon the size and desirability of the order. An eastern Pennsylvania steel maker is negotiating for a round tonnage of standard low phosphorus iron. Small sales of this grade at $23.50, Philadelphia basis, are reported. Easier prices have developed in Lebanon low phosphorus iron and the $20 furnace price has been slightly shaded in close competition. A local buyer has withdrawn an inquiry for 500 to 1,000 tons of early malleable.

Iron and Steel Bars.—Some improvement in specifications from eastern consumers of steel bars has appeared the past week, but the tonnage is still less than it was under the heavy ordering of some weeks ago. New business is light though some negotiations of good size continue to be carried on with eastern Pennsylvania buyers by Pittsburgh district makers, and these are likely to be closed soon. Steel bars remain very firm at 1.40c, and some premiums are still being paid for prompt shipment. The eastern Pennsylvania bar iron situation shows greater easiness in that 1.50c, mill, is no longer the firm minimum of the market and can be shaded upon a desirable order. New buying is lighter.

Plates.—Because of the decline in the eastern market on structural shapes to the level that has been steadily quoted by producers in the Pittsburgh district, buyers here made renewed efforts to get eastern Pennsylvania plate makers to grant concessions. These makers, however, have declined to acquiesce in the wishes of buyers and continue to hold tank steel for domestic shipment at 1.60c, Pittsburgh, or 1.75c, Philadelphia, with $1 extra on universal plates in many cases. Some good-sized lots upon which consumers asked $2 a ton concession and were refused, were finally placed by them this week at full prices. New business generally continues of a miscellaneous character, and is not so heavy, but the mills are not making much headway against deliveries, which are practically unchanged. Inquiries have come out for 10,000 to 15,000 tons of plates for export to Europe, but in view of present price levels, there does not seem much likelihood that this business will come to this side.

Structural Shapes.—Some of the larger structural mills of eastern Pennsylvania still have such a liberal accumulation of orders on their books that they are unable to promise shipments under eight to ten weeks. Other makers are not so fortunate, and while they cannot deliver smaller shapes more promptly, their larger mills have more irregular schedules, and they are more earnestly seeking business of the latter character. Upon such orders they are able to deliver in two to three weeks. New business is not of large tonnage. Prices with eastern mills continue to be named at 1.45c, Pittsburgh, or 1.60c, Philadelphia, upon the larger run of orders. Where especially prompt delivery is given, from $1 to $2 a ton extra is often obtained.

Sheets.—The demand for the heavier gages of blue annealed sheets running from No. 8 to No. 16 is being maintained in a very encouraging fashion for eastern producers. The call for No. 16 gage remains especially brisk. The activity in the lighter gages is not so pronounced. Deliveries with eastern Pennsylvania makers now run from three to four weeks. Prices are staple upon the basis of 1.75c, Pittsburgh, or 1.90c, Philadelphia, for No. 10 gage.

Semi-Finished Steel.—Consumers of billets are not placing fresh business so freely with eastern makers, but there is a very insistent demand for prompt delivery under running contracts, and producers have some trouble in distributing their output to satisfy all customers. Makers have little or no prompt steel to offer, and have, in some cases, fully half of their third quarter capacity now under formal contract. Buyers in the Pittsburgh and western districts are still putting some inquiries before eastern sellers, but these are not so large or so numerous. Makers readily obtain $28 to $30, delivered in Philadelphia and vicinity, for rerolling billets and $5 to $6 higher for forging billets.

Coke. — Some eastern furnaces which are still buying their coke requirements in week to week lots are enabled to obtain standard Connellsville fuel at from $2.25 to $2.40 ovens. The latter represents the figure where

certain high grade brands were desired. There is little interest in contract furnace coke. A number of foundry coke contracts are now being renewed.

Old Material.—The latest drop in old material values which has now proceeded for some weeks shows no check, and the market continues weaker. Consumers, on the whole, are still listless and are buying sparingly. Heavy melting steel ranges 25 cents lower, with sellers willing to accept $12.25 to $12.50, delivered, and consumers offering 25 cents, more or less. The steel sold by the railroads this month brought better than $12.50, delivered, going to steel works direct, as against old contracts taken at higher than present prices. The No. 1 railroad wrought went at about $15, delivered. Sales of this grade for current delivery have been made at $14.75, delivered. The supply of borings and turnings continues to exceed the demand and prices are suffering. Low phosphorus scrap has joined in the general decline.

Birmingham Producers Resist Decline

And Prevailing Pig Iron Prices for Southern Delivery Exceed Those for Northern Delivery

Office of THE IRON TRADE REVIEW,
Birmingham, Ala., May 20.

Pig Iron.—Local producers still adhere strictly to a basis of $12, per ton at Birmingham, for any tonnage offered, for southern delivery, and are apparently no more disposed to shade that price than at the time of last report; however, the business transacted in the past week is very small, with a very limited tonnage now pending. Specific information is furnished to cover the sale of 100 tons and carload lots aggregating 1,100 tons; a single lot of 500 tons of high manganese iron; two lots of 450 tons each of No. 2 soft, and a single lot of 300 tons of No. 3 foundry, all of which is for early delivery. Except for the high manganese tonnage, the price considerations were on a basis of $12, at Birmingham for No. 2 foundry, with a differential of 50c per ton for the lower grades. These requirements came from southern territory and represent actual needs in the majority of cases. From the same source, and from the north and east, more or less tonnage has recently been offered in tentative form for delivery to cover the remainder of the year, but in all such cases the figures offered are lower than the furnace asking price. A basis of $11.50 per ton seems to be the most popular consideration among the trade for last half requirements, and it is likely that several round tonnages could be entered at such figures. The producers, however, feel that a $12, Birmingham basis, will be maintained through the remainder of the year, and for the present at least, are being governed accordingly in submitting prices. Forwardings from the several plants have not increased to any appreciable extent, but one large furnace is still banked for repairs that became necessary early in the month. In short, the situation is practically the same as last reported, although it now seems positive that a $12 basis is the maximum price consideration, and quotations are revised accordingly. (See revision in tabulated price list.)

Cast Iron Pipe.—Report is made of several attractive lettings in the East, but local producers have participated in a very small volume of new business. Specifications against previous contracts are still fairly liberal and the bulk of the output at the majority of plants is being moved.

Old Material.—The market continues exceedingly dull without indications for an early improvement.

TIN PLATE MAKERS

Propose Curtailment of Production, But English Employers Object.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., May 10.

Pig Iron.—The pig iron market still exhibits a certain amount of irregularity. The Cleveland market has kept up better than most people expected, but to some extent it has benefited by the brighter outlook in eastern Europe and the tolerable certainty that the conclusion of peace will open up various closed markets. There was an advance of 4½d on the day yesterday, leaving the quotation for various warrants 68s ($16.64). The striking difference of course is between current quotations and three months figures. The selling quotation for the latter iron is 61s 9d ($15.12). The amount now in store is 219,000 tons, a relatively trifling quantity. Makers have been obliged to pull down their quotations somewhat, but they are without stocks, and all their production is going direct from the furnaces to the customers. The shipments during April were the best of the year, totalling 104,000 tons. The makers' position is considered very sound, with a great demand for iron in prospect. The East Coast hematite trade is very brisk with a great amount of pressure for delivery, and buyers who require prompt supplies are in rather a tight place. For Northampton and Derbyshire forge iron prices are lower every week by anything from 1s to 2s per ton. The quotation for Northampton iron yesterday was 62s ($15.18) to 63s ($15.30), but buyers were endeavoring to contract at 60s ($14.68)—and as they expect to be able to do so shortly the negotiations yielded no immediate result.

Finished Iron and Steel.—The publication this week of the Board of Trade returns, showing fairly large increases for April over a year ago has surprised a good many who for several weeks past have been indulging in gloomy forebodings, and generally seeing only the black side of things. The quantity of iron and steel and manufactures theerof, exported during April was 460,812 tons, compared with 287,827 in April last year.

In the tinplate trade, a slightly better tone is reported, with a little increase of business with Canada and the United States, at prices which it is frankly admitted have been severely cut to meet American competition. A conference has taken place in South Wales this week of employers and workmen, in which the latter frankly propose a sweeping policy of reduced output by stoppage of mills. As there are already about 130 mills idle, such a proposition speaks eloquently of the state of affairs in South Wales. The employers did not take kindly to the suggestion, on the ground that if they voluntarily shut down more mills, they would leave their competitors still further in possession of the field. Prices have improved the last few days, and if the end of the war should re-open the eastern markets, there is every hope that the tinplate trade may take a turn for the better.

The steel trade continues busy, but the general lack of orders has had a sentimental effect on prices, so that in most lines slight reductions would be accepted.

The case is very different with common bars, as in the Darlston district it is still possible to buy No. 2 German bars at £6 7s 6d for nut and bolt making. This is at least £1 below local figures.

Uncertainty Prevails in New York Pig Market

But Inquiry Has Slightly Improved—Bar Users Pressing for Deliveries—Germany Would Like to Buy American Ore

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg.,
New York, May 20.

Iron Ore.—Inquiries for iron ore recently received by eastern sellers from European importers for shipment to the continent, as previously published, call for high grade material, preferably of Bessemer analysis, running 55 to 60 per cent in iron. These buyers, who are negotiating for the account of German consumers, offer to make contracts for 60,000 tons annually for a term of years, if satisfactory prices can be obtained. They will take 10,000 to 20,000 tons for this year. In view of the long haul, it is not believed that anything permanent can result from these negotiations under the present respective levels of European and American markets. The purchase of Texas ore by the Alan Wood Iron & Steel Co., recently noted, calls for a trial cargo of 5,000 tons of concentrates, analyzing around 63 per cent in iron. Upon the success obtained with this cargo, will depend whether a round tonnage of this ore will be purchased. A longshoremen strike in Philadelphia has interfered somewhat with the unloading of ore cargoes.

Pig Iron.—Very meager buying still leaves the pig iron market in the metropolitan district dull and uninteresting and more or less uncertain as to its price possibilities. A slightly improved inquiry has come out the past week, but this has referred only to a few buyers. The general run of consumers remains indifferent and shows little disposition to buy for forward delivery. The total of weekly sales of all offices in this district makes a poor showing. A New Jersey soil pipe maker has asked for 700 to 1,400 tons of No. 2X for third quarter and fourth quarter and another Jersey buyer continues to ask prices on 500 tons of No. 2X. A New England consumer has entered the market for several thousand tons of foundry grades. A radiator company is reviving some inquiries. The prevailing price of No. 2X iron at tidewater under present conditions falls within the range of $16.75 to $17, but it is indicated that this price could probably be shaded on a considerable tonnage. Some eastern Pennsylvania iron for New England delivery has been quoted on a basis equivalent to $16.60, tidewater, for No. 2X. The New England market remains at $17.45, delivered, for No. 2X, which is equivalent to $15, Buffalo. There is considerable inquiry stirring in the export market for shipment to Mediterranean points. Some sales recently made by southern makers on such business have been on the basis of $11.50, Birmingham, for No. 2. These makers will not go this low on domestic business, however. There have been some reports that as low as $11.25, Birmingham, has been done on export business, but since the belief that such a price was named depends largely upon the matter of ocean freight rates, which vary considerably, there is some question whether such a level was actually made.

Ferro-Alloys.—Further instances of carload sales of ferro-manganese at close to $59, seaboard, have appeared the past week. There is a disposition among regular sellers to attribute this shading to resale material in the hands of middlemen. Pending inquiry for ferro-manganese consists chiefly of carloads. New business in the other alloys is light.

Plates.—With new buying of cars now proceeding at a much reduced gait, the larger plate makers of the Pittsburgh district are not booking a very heavy new tonnage for forward periods of delivery. There is no anxiety shown in this regard, however, since these makers are sold up practically full into the late third and partially into the fourth quarter and specifications are running heavily. Their prices remain 1.45c to 1.50c, Pittsburgh. Eastern Pennsylvania makers are entering a lighter volume of new business, but they have a good accumulated tonnage and they are declining to meet the wishes of buyers that they shade their schedule of 1.60c, Pittsburgh. Premium business is now of small volume.

Structural Material. — The going market on structural shapes from eastern Pennsylvania mills continues 1.45c, Pittsburgh, or 1.61c, New York. Very early deliveries can be obtained at this basis, although some makers more fortunately situated with orders than others are still demanding premiums of $1 a ton or more for stock for nearby shipments. Some of the eastern mills have their rolling schedules for six weeks ahead well filled, but others have considerable open tonnage, especially on the larger sizes of shapes for as close as two to three weeks. Specifications are liberal but new business is not heavy. The principal activity in the eastern structural market is in bridge work among the railroads, where 10,000 to 12,000 tons is now up for bids. Commercial lettings in the New York district reach only a few thousand tons. Fabricated work continues to be keenly competed for.

Iron and Steel Bars.—Consumers of steel bars in this territory appear as insistent as ever in pressing the mills for prompt deliveries upon their specifications. This condition is believed to reflect the bareness of stocks in this and other districts. There is little buying for forward delivery, which at this time, because of crowded mills, must take its place some months hence. There is a fair amount of odd lot business for such early periods as the mill can accommodate. Bar iron continues less strong, which probably relates closely to the decreased demand for steel bars and prices are gradually softening.

Cast Iron Pipe.—Pipe shops of eastern Pennsylvania now have tonnages upon their books which will run them full for six weeks or more, but they are not entering new business so freely. Private lettings are not up to normal at this season, but the public contracts aggregate a very fair tonnage. Competition on the larger orders is quite keen and prices show more or less instability. Certain shops continue more aggressive than others. Newark, N. J., will take bids May 22 on 2,000 tons of 36-inch pipe. Bids went in the past week on 1,125 tons for Lowell, Mass., and 600 tons for Fitchburg, Mass., but the awards are not announced.

Rails and Track Material.—There continues a very liberal inquiry for small lots of rails for domestic shipment to fill out the requirements of leading systems and from traction and interurban roads. Lettings of the latter character are fair. There is also an active demand for export. Including the 45,000 tons for a new Cuban line, recently reported, these inquiries will aggregate about 60,000 tons. Standard spike prices continue around 1.80c, Pittsburgh, but there are some suggestions that this level might be shaded. The Jones & Laughlin Steel Co. is low on 1,200 kegs for the Panama canal.

Old Material.—Uncertainty marks the course of old material. Dealers are having difficulty to obtain new orders, as consumers see little inducement to purchase freely under present conditions. Furthermore, the latter are imposing strict requirements upon shipments received and rejections are numerous.

Southern Pig Iron Lower at Cincinnati

With $11.50 Now the Minimum—Market Remains Dull—Old Material Declines

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg.,
Cincinnati, May 20.

Pig Iron.—The market has gradually yielded to unfavorable conditions during the past week, until the minimum price for southern No. 2 foundry iron is now $11.50, Birmingham basis, for any delivery this year. This price has recently been made by both Alabama and Tennessee furnaces, although they are far in the minority in comparison with those asking higher prices. The remaining stacks in both states are holding firmly at either $11.75 or $12, Birmingham basis, for any delivery, and thus far have refused to make concessions. Several sales have also been reported made recently at these higher prices.

The southern Ohio situation is unchanged, and $15, Ironton basis, is still the minimum price for No. 2 foundry iron from this district. Several stacks here also are holding at a higher level, and are probably closing as many sales at $15.50, Ironton, as are being made at the lower figure of $15. The strength in this territory has been due to the fact that the cost of operation has increased approximately a dollar a ton within the past eight or ten months, and a lowering of quotations below $15, Ironton, would seriously affect profits.

Despite these concessions, the market remains dull, and inquiries are perhaps even more scarce than they were last week. There is one here for 1,000 tons of malleable iron from an Indiana melter, but the rest are generally for very small tonnages. There is also the probability that a little iron is being secretly sold, but while several of the larger users are apparently ready to purchase for the last half, they have withheld placing their orders until it appears that the bottom of the present decline has been reached.

Coke.—There are conflicting reports as to the present condition of the coke market, but it is quite probable that it is a little stronger. Dealers here predict that there will be a shortage of coke within the next six months, due to the fact that labor conditions in the coke fields are very unfavorable. There are several inquiries from eastern furnaces, calling for lots of 3,000, 5,000, 10,000 and 20,000 tons per month to be delivered during the last half. Foundries are also beginning to renew old contracts for last half requirements, but there is not much new business being placed.

Finished Material.—The local sheet mill is receiving specifications in a little better volume than has been the case recently and is still from four to six weeks behind on deliveries. Prices are firm at 2.35c, for black sheets and 3.40c for galvanized sheets, both 28 gage, Pittsburgh basis.

Warehouse business is only fair, but prices are unchanged. The local street car strike had a bad effect upon securing new orders, in that customers remained away from the city, and the warehouse men had a difficult time calling on the trade. There is not such a depletion of stocks in warehouse yards as was the case earlier in the spring, which shows that the situation has eased up to a certain extent.

Old Material.—The scrap iron market has reached the point where market quotations are practically being discarded and prices at which sales are being made depend altogether upon the conditions that govern them. It is certain, though, that a reduction has taken place again, covering practically all of the grades of scrap carried by dealers here, ranging from 25 cents to $1, a ton.

METAL MARKETS

Chicago

May 19.

New Metals.—Prices on copper remain unchanged, although a fair amount of buying is being done. In this territory copper has been affected by an easy eastern market. Spelter is lower, the larger buyers covering for their requirements this week at 5.35c, delivered in Chicago.

We quote dealers' selling prices f. o. b. Chicago, as follows:

Lake copper, carload lots, 15⅝c; casting, 15¼c; smaller lots, ⅛c to ¼c higher. Spelter, car lots, 5.35c; lead, desilverized, 4.25c; sheet zinc, $7.75, f. o. b. La Salle, in car lots of 600 pound casks; pig tin, 48.57c; Cookson's antimony, 8⅛c, other grades, 7⅝c.

Old Metals.—The scarcity of old metals is less pronounced and the market is quiet. As manufacturers have had no opportunity to acquire stocks the inactivity must be ascribed to the condition of the money market, which is affecting all lines of trade.

We quote, dealers' selling prices f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 15½c; copper bottoms, 13c; heavy red brass, 13½c; heavy yellow brass, 10½c; No. 1 red brass borings, 12¼c; No. 1 yellow brass borings, 8½c; brass clippings, 10½c; lead pipe, 4c; zinc scrap, 4¼c; tea lead, 3¾c; No. 1 aluminum, 20c; No. 1 pewter, 38c; block tin pipe, 46c; tin foil, 44c; linotype dross, 3¼c; electrotype dross, 3¼c; stereotype plates, 4¾c; stereotype dross, 4½c.

New York

May 19.

Lead.—It has been a dull week in the lead trade, but prices have kept firm at 4.35c in New York.

Copper.—Buyers have been less active in the copper market during the past week than in the preceding one. The let-up in demand was followed by freer offerings from second hands and easier prices, cash electrolytic being offered at 15.62½c in New York. Leading sellers are firm at 15.87½c for electro, and 16c for lake, however, and are well fortified with orders, against having to seek buyers until the cheap copper has been cleaned up. Exports of copper continue to reflect heavy consumption needs abroad, and deliveries into domestic consumption are said to be larger also. It is likely that surplus metal will be further reduced at the end of May. Exports since May 1 total 23,290 tons.

Tin.—Since May 13 spot tin has declined £10 per ton in London and 2c per pound in the domestic market. On the above date there was a backwardation of £10 in futures, but at the close of business May 19 half of that difference had been wiped out. Spot closed at £219 15s and three months at £214, as compared with £229 10s and £219 10s a week ago. The foreign market has been marked by heavy transactions but domestic trade has displayed very little life beyond the price changes. Spot and May tin sold in small lots at 48c in the outside market on Monday. Arrivals since May 1 aggregate 2,397 tons and there are 1,895 tons afloat.

Spelter.—Quotations on spelter have declined 10 points to 5.45c in New York, and steel buyers are holding off with the expectation that they will have an opportunity to get the metal cheaper before the tariff schedule is settled.

Antimony.—Prices of antimony are lower and there is very little demand from any source. Cookson's is 8.87½c, Hallett's is 8.37½c and other brands 7.50c to 7.75c.

University's Fortieth Anniversary

A number of engineers of national prominence are planning to attend the fortieth anniversary of the founding of Ohio State University at Columbus, June 8 to 11. Among the prominent graduates of the university who are expected to be present are Ralph Davenport Mershon, one of the most eminent electrical engineers of the country; Alexander M. Gow, assistant chief engineer of the Oliver Iron Mining Co., Duluth; Benjamin M. Lamme, chief engineer of the Westinghouse Electrical & Mfg. Co., Pittsburgh; A. H. Rohrer, electrical superintendent of the works of the General Electric Co., Schenectady; N. W. Storer and P. M. Lincoln, the latter with the Westinghouse company.

Fair Number of Structural Contracts

Including Extensions to Finishing Capacity of Bethlehem Steel Co.—Chicago Shops Busy on Small Jobs

Fabricating shops in Chicago are being kept busy on small jobs, an unusual number of which are coming up for disposal. This condition is more satisfactory both to contractors and producers, as the margin of profits in small contracts is larger than in big ones. Fabricating prices seem to be a little better as the business in sight is sufficient to overcome competition to some extent. In some ways, conditions are reminiscent of last fall and one contract calling for about 250 tons is noted which was filled entirely from store. During the past week a total of 3,075 tons was involved in contracts placed, the largest of which called for 700 tons for the Thompson building, Oakland, Cal. This was taken by the Western Iron Works. Other contracts are as follows: The Minneapolis Steel & Machinery Co., 600 tons for a coal-handling bridge for the Minnesota Steel Co., New Duluth, Minn., and 300 tons from the Twin City Cold Storage Co. for a cold storage building and power house at Minneapolis; the Milwaukee Bridge Co., 385 tons from the Chicago, Rock Island & Pacific Ry. Co., for the Bridge street viaduct, Peoria, Ill.; American Bridge Co., 456 tons from the Wisconsin River Power Co. for transmission lines between Prairie ud Sac and Portage, Wis. The Blodgett Construction Co., Kansas City, Mo., has placed a contract for 180 tons for four 80-foot deck plate girder spans, and Snohomish county, Wash., has contracted for 124 tons for a 240-foot draw span.

The Clinton Iron & Steel Co., Pittsburgh, has awarded the Riter-Conley Mfg. Co. a contract for replacing the blast furnace which collapsed several weeks ago, shortly after being blown out. About 250 tons of steel are involved.

The Jones & Laughlin Steel Co. has taken 150 tons for the Solomon building, Fifth and Grant streets, Pittsburgh.

An addition to the store of Boggs & Buhl, Pittsburgh, will require 2,000 tons of structural steel instead of 700 as was originally estimated.

More frequent reports are heard that a hotel will be built on the old cathedral site, Pittsburgh, by the Statler interests. A heavy tonnage would be involved.

The American Bridge Co. has taken 2,500 tons for the Pantlind hotel, Grand Rapids.

T. H. Brooks & Co., Cleveland have been awarded the contract for 1,200 to 1,500 tons of steel for the new building of the Firestone Tire & Rubber Co., Akron, O.

Structural contracts awarded in the east were:

Public drawbridge at Millville, N. J., to Owego Bridge Co., 300 to 400 tons.

Extensions to finishing capacity of plant of Bethlehem Steel Co., South Bethlehem, Pa., 2,800 tons, to McClintic-Marshall Construction Co.

Office building, South Penn Square, Philadelphia, 2,100 tons, now reported to have gone to Phoenix Bridge Co.

Edison Electric & Illuminating Co. power house, Boston, 365 tons, New England Structural Co.

High school, Williamsport, Pa., 535 tons, Geo. Kellogg Iron Works.

High school, Flushing, L. I., 800 tons, to Hedden Iron Works. Cambria Steel Co. will furnish steel.

Retort house, Hartford, Conn., for the United Gas Improvement Co., 300 tons to Lehigh Structural Co.

Shelter shed at North Philadelphia for Pennsylvania railroad, 200 tons, to Belmont Iron Works.

Bridge for New Haven road on Providence division, 260 tons, to Phoenix Bridge Co.

Shops for Western Maryland railroad, Hagerstown, Md., 265 tons, to McClintic-Marshall Construction Co.

Pier shed at Jersey City and bridges at Jersey City and Elizabeth, N. J., for Central Railroad of New Jersey, about 500 tons, to Hay Foundry & Iron Works.

Geisinger Memorial Hospital, Danville, Pa., 225 tons, to independent shops.

The American Bridge Co. has taken an order for transmission line towers, involving between 700 and 800 tons for the Alabama Power Co. for delivery to central Alabama.

Pending Structural Work

Military Plaza Hotel, Newark, N. J., 1,200 tons, bids in.

Loft building for Twenty-seventh street and Seventh Avenue Realty Co. at that address, New York City, 1,200 tons, bids in.

Theater and office building for Sutphen estate, Forty-seventh and Broadway, New York City, 1,000 tons, bids in.

New plant National Carbon Co., Jersey City, 600 tons, bids in.

Loft building for Nodrog Realty Co., 108-110 W. Twenty-fifth street, New York City, 500 tons, plans issued.

Peabody apartment house, Seventy-fifth street and Broadway, New York City, about 500 tons, plans coming out.

Apartment house, Park avenue and Seventy-seventh street, New York City, about 2,000 tons, now being planned.

Printing house for Hill Publishing Co., Thirty-sixth street and Tenth avenue, New York City, 3,500 tons, indefinitely postponed.

The Wm. Steele & Sons Co., Philadelphia, have taken a permit to erect a power house 79 x 85 feet, at Blaton street and the Reading railroad in that city for the Geo. W. Blaton Co. The estimated cost is $20,000.

On the addition to the Arcade building, Philadelphia, 1,300 tons, bids are going in this week.

Fire at Plant of Lumen Bearing Co.

Fire visited the plant of the Lumen Bearing Co., Buffalo, on Sunday, May ing Co., Buffalo, on Sunday, May 11, destroying the coke and sand sheds and the wood buildings at the rear of the main foundry. While such of the buildings as were of wood construction were consumed, the destruction was stopped by the concrete floor and roof of the pattern shop and the fire doors between it and the pattern storage building acting automatically. No damage was done to patterns or foundry proper and the work of replacing the burned portion with fireproof buildings is already under way. No interruption to business was caused.

Berwick Plant Inspection

A number of prominent railroad officials made a thorough inspection of the Berwick, Pa., plant of the American Car & Foundry Co. on Friday, May 2, 1913, under the personal guidance of C. D. Eaton, sales agent of the company. The inspection was thorough, special attention being given to the latest machines and labor-saving devices, as the plant represents an up-to-date equipment in all detail. The first steel passenger car manufactured in the United States was made in the Berwick shop of the American Car & Foundry Co., and was operated by the Interborough Rapid Transit Co., in the New York subway.

Ralph C. Coples, who, for some years was traffic manager of the National Steel & Wire Co., but has since engaged in railroading, has been made general traffic manager of the Western Maryland railroad.

NO SLASHING

Of Metal Schedule, Says Senator Stone of Sub-Committee.

Washington, May 20.—Following a meeting today of the majority members of the senate finance committee, Senator Stone, chairman of the subcommittee having the metal schedule in charge, laid at rest reports that a general reduction in that schedule is contemplated. He said it can be announced as being official that no such plan is under way.

The senator asserted he is not in a position at this time to discuss specific items. It is a virtual certainty that numerous changes, all downward, are being considered, however, in addition to those already voted upon. Reports that the metal schedule is to be slashed throughout in order that cotton fabrics may be increased to conciliate New England and Southern interests associated with the latter industry, are indicated by Senator Stone's statement to be unfounded. It was contended that the committee meant to increase the cotton fabric schedule—and this may be done—and decrease the metal schedule in a relative proportion to maintain the same quantity of importations, thus keeping the importations up and netting a parallel revenue.

Senator Simmons, chairman of the senate finance committee, said that a number of iron and steel makers had come to Washington and protested to members of the metal subcommittee against some of the Underwood paragraphs, among the list being wire makers, whose products have been placed on the free list.

Senator Kenyon, Iowa, has offered an amendment placing aluminum on the free list. Whether this will occasion any fight either in caucus or on the floor is not known, but there have been no surface indications of such a thing. The Payne duty on this article is 7 cents per pound, and the Underwood bill provides a duty of 25 per cent ad valorem, a cut of about 30 per cent.

By a purely partisan division the senate this afternoon voted 42 to 29 in favor of a motion by Senator Simmons, chairman of the senate finance committee, to refer to that committee Senator Penrose's resolution requesting the chairman of the finance committee to furnish the senate the names of all manufacturers, corporations, importers or other persons who have appeared before the majority members of the finance committee or the sub-committees to discuss tariff schedules, and also calling for the printing of 2,000 copies of the questions framed by Senator LaFollette and Senator Bristow. Senator Penrose accepted amendments offered by Senator Hoke Smith and Senator Reed calling for the names of those persons who have called upon minority members of the finance committee, and of all persons who made such calls upon the members of the finance committee while the Dingley and Payne laws were being framed.

LUKENS WAS LOW

On Bids for Plates for Naval Colliers —Shapes Not Placed.

The Lukens Iron & Steel Co., through Barker & Ross, Baltimore, was low bidder on 4,500 tons of ¼-inch and over rectangular steel plates for government naval colliers Maumee and Kanawha, delivery at Mare Island, California. The low bid was 1.50c, mill, or 2.10c, delivered. The Carnegie Steel Co. bid 1.45c, Pittsburgh, or 2.30c, delivered. Worth Bros. entered three bids, 1.55c, 1.50c and 1.60c, or 2.19c, 2.14c and 2.30c, delivered, respectively.

The Lukens Iron & Steel Co. was low on 1,100 tons of sketch plates for the same vessels at its bid of 1.60c, mill. The Carnegie Steel Co. bid 1.70c, Pittsburgh. Worth Bros. bid 1.65c, 1.60c and 1.70c, respectively, all at works. The Carnegie Steel Co. was low on 410 tons of ⅛ to 3/16-inch plates for the same vessels at its bid, 1.64c, Pittsburgh.

The 1,800 tons of structural shapes for these vessels, upon which the Jones & Laughlin Steel Co. is low, have not yet been placed.

New England Foundrymen Meet

Almost 200 foundrymen and others interested in the foundry industry were present at the meeting of the New England Foundrymen's Association, which was held at Hartford, Conn., May 14, under the auspices of the Connecticut members of the association. After assembling at the headquarters, the Allyn House, in the afternoon, the entire party was taken in automobiles on a trip to points of interest about Hartford, the destination of which was Simsbury, Conn., about 20 miles distant, where light refreshment was served. Returning to the Allyn House, dinner was served at six o'clock and the crowd, by this time, had been augmented by many new arrivals. The subject of the evening on "The Control of Temperature and Other Conditions in the Baking of Cores," was presented by H. M. Lane, of Detroit. Robert C. Bird, president of the association, presided.

RAILROAD BRIDGES

Figure Prominent in Structural Business—Rail Orders.

Total railroad bridge work pending is 10,000 to 12,000 tons, including the following:

Delaware, Lackawanna & Western railroad, 10 to 12 bridges, about 3,000 tons. Bids entered; Baltimore & Ohio railroad bridge on the Monongahela river, near Pittsburgh, 3,000 tons; Norfolk & Western railroad, 2,800 tons, bids taken this week; Manila Railways, about 2,000 tons up for bids.

The Wisconsin Bridge Co. has taken an order for 330 tons from the Missouri, Kansas & Texas for bridge work.

Rail orders include the following: Baltimore & Ohio railroad, 500 tons of 120-pound tee rails to the Maryland Steel Co. for tunnel work at Baltimore; Bay State Railways, Boston, 700 tons of girder rails to the Pensylvania Steel Co.; Fort Wayne traction lines, 500 tons of tee rails to the Illinois Steel Co.

Rail inquiries pending are: Kansas City Southern, 7,000 tons; Virginia Carolina railway, 5,200 tons; Hudson & Manhattan railroad, 600 tons of tee rails; Western Australian railway, 7,000 tons; railroad in Honduras, 1,600 tons.

The New York Central Lines have increased their locomotives to a total of 179, of which 159 will be furnished by the American Locomotive Co. and 20 by the Baldwin Locomotive Works.

The Bessemer Railroad Co. has ordered 14 locomotives from the American Locomotive Co. and the Baldwin Locomotive Co.

At a cost of $3,742,059, the Soo Line, in preparation for an expected increase in traffic and greater demand for rolling stock, will add 2,295 cars to its equipment and, with some of the new cars already arriving, will have the full complement in use for the grain crop. The 1913 order will be as follows: Twenty-five locomotives, 1,500 40-ton box cars, 200 40-ton ballast cars, 300 50-ton steel ore cars, 28 wheel cabooses, 50 coaches, sleeping, dining or buffet cars.

The Illinois Steel Co. has taken 7,000 tons of Bessemer rails for the Kansas City Southern, and the Tennessee Coal, Iron & Railroad Co. has taken 5,000 tons for the Cuban Central. Scattered rail orders booked by the Corporation during the week reached 5,000 tons.

On the bridge for the Baltimore & Ohio railroad on Monongahela division near Pittsburgh, 3,000 tons, bids have been asked.

George A. Ranney has been chosen secretary of the International Harvester Co.

ARMOR PLANT

To be Operated by Government is Now Being Considered.

Washington, May 21. (By wire.)—It was announced this morning from the office of the assistant secretary of the navy, Franklin D. Roosevelt, that a long statement would be issued today, regarding informal talks between Secretary Daniels and Assistant Secretary Roosevelt, on plans being considered for a government erecting and operating armor plant.

Asked if he found any competition at all, Secretary Daniels said it is like three men in bed, each guessing which one is going to get out first. He thinks a government plant is at least sufficient to force competition.

He is investigating the cost of building and operating a plant and the cost of manufacture by steel companies of the country. Daniels may send naval experts to Europe this summer to investigate. He will not go abroad, but personally may visit plants here.

As the Hurst resolution, asking an investigation of the armor plate industry, has not yet been acted upon, it has nothing to do with the action of the navy department. The report of the industry made by former Secretary of the Navy Herbert, will be studied.

Inquiry into the cancellation of the contract for the dreadnaught Pennsylvania, has not been considered, Daniels said. It was awarded to the Bethlehem, Midvale and Carnegie steel companies for $454, class "A" armor.

Daniels could not be seen today, but it was stated at his office that he was not prepared to say what he considered relative cost here and in other countries. The claim is made that all countries except Russia and Japan, pay more than the United States. Japan is the only government making its own armor plates. The question of big royalties said to be paid by steel companies here has not been taken up.

Westinghouse Tonnage Still Pending

Pittsburgh, May 21. (By wire.)—The Westinghouse Electric & Mfg. Co. has not closed negotiations for second half foundry requirements for foundries at Cleveland and Pittsburgh up to noon today. The company has been in the market almost a fortnight, during which time quotations have gradually declined. There is some indication that the transaction will be closed late this afternoon. One of the probable reasons for delay is the fact that neither buyers nor sellers appear to have any definite ideas regarding the status of the pig iron market.

STRIKE TROUBLES

Interfere With Iron and Steel Industry in the East.

Labor troubles in the Philadelphia district are having some effect upon the iron and steel industry in that locality. A strike of the longshoremen has interfered with the unloading of cargoes of foreign iron ore at that port, especially at the docks of the Philadelphia & Reading railroad. Several thousand of the longshoremen are out and shippers have found difficulty to get suffcient men to handle the ore cargoes.

In some of the shops in Philadelphia and vicinity the molders have struck in pursuance of their recent demand for a 25 cents advance. The troubles in this respect, however, are, as yet, of a minor character.

Will Consider Corey Wire Plant

New York, May 21. (By wire.)—The finance committee of the United States Steel Corporation at an adjourned meeting this afternoon will take up consideration of renewing the construction of the wire plant at Corey. Suspension of work upon this plant was the cause for the recent agitation among leading southern business men who conferred with government officials at Washington and with Judge Gary and Corporation executives at New York.

Pushing Plans for Canadian Plant

New York, May 21. (By wire.)—There is no foundation for the report that construction work at the new Canadian plant of the United States Steel Corporation at Ojibway will not begin for several years. Plans for this plant are now being pushed steadily and it is officially stated that the foundation and preliminary work will probably begin this summer. The organization for the new Canadian subsidiary is now being assembled.

Death of Inventor

Stephen Dudley Field, who invented the trolley car, the electric elevator, the stock ticker and numerous other electrical devices, died at his home at Stockbridge, Mass., May 18, at the age of 68. One of his latest important inventions was the cable quadruplex, which permits four messages to be sent over a cable wire.

OBITUARIES

Alexander Forsyth, superintendent of the Burlington railroad shops in Aurora, Ill., since 1887, died at the St. Charles hospital in that city recently.

Andrew Plocher, head of the City Forge & Iron Works, Dayton, O., died recently at the age of 63 years. In 1895 he founded the iron works of which he was the head at the time of his death.

Frank O. Briggs, secretary of the New Jersey Wire Cloth Co. and an officer of other allied Roebling companies, former United States senator and former mayor of Trenton, N. J., has died at Trenton, N. J.

James S. Marshall, 73, father of Charles D. Marshall, president of the McClintic-Marshall Construction Co., Pittsburgh, died last week. He served in the capacity of purchasing agent for the McClintic-Marshall company the last 15 years.

W. H. Weber, manager of the Electric Metal Stamping Works, New Hamburg, Ont., aged 45 years, was instantly killed, May 13, by falling from a gangway between two of the company's buildings, owing to the breaking of a hand rail.

William Cotton, for nearly 30 years treasurer of the American Tube Works, of which he was also a director, died May 15, at Brookline, Mass. He was a son of Joseph K. Cotton, who at an earlier period was also treasurer of the company.

Clarence Deming, for many years editorial writer and associate editor of the Railroad Age-Gazette, has died at New Haven, aged 65 years. He had been a writer since he left Yale in 1872. Since 1887 he had been a free lance in journalism and public life.

Adolphus Bonzano, inventor and bridge engineer, died at his home in Philadelphia recently, aged 83. Mr. Bonzano was born in Germany and received his engineering education in foreign schools. Shortly after coming to this country he had charge of the construction of the plant of the Detroit Bridge & Iron Works. Later he became associated with Clark, Reeves & Co., which later became known as the Phoenix Bridge Co., of which Mr. Bonzano was made vice president and chief engineer, a position which he held until 1893. Among the prominent bridges designed by Mr. Bonzano are the Pecos viaduct, the Kinzua bridge over the Erie railroad, the Chesapeake & Ohio bridge over the Ohio river at Cincinnati and the Girard avenue bridge at Philadelphia.

IRON AND STEEL PRICES

Pig Iron

PITTSBURGH

(Through Third Quarter.)

Bessemer	$17.90
Basic	15.65
No. 2 foundry	15.40
Malleable	15.40
Gray forge	14.90

The freight rate from valley points is 90c.

CLEVELAND

(Through this Year Delivered in City.)

No. 1 foundry	$16.00 to 16.25
No. 2 foundry	15.50 to 15.75
No. 2 southern	16.10 to 16.25
Bessemer	17.90
Silverites 8 per cent silicon	20.55

CINCINNATI

(Through This Year.)

Southern foundry No. 1	$15.25 to 15.75
Southern foundry No. 2	14.75 to 15.25
Southern foundry No. 3	14.25 to 14.75
Southern foundry No. 4	14.00 to 14.50
Southern gray forge	13.75 to 14.25
Mottled	13.75 to 14.00
Southern No. 1 soft	15.25 to 15.75
Southern No. 2 soft	14.75 to 15.25
Standard southern car wheel	27.25 to 27.75
Southern Ohio No. 2	16.20 to 16.70
Southern No. 3	15.70 to 16.20
Southern Ohio No. 4	15.45 to 15.95
Silveries 8 per cent silicon	19.70 to 20.20

CHICAGO

(Delivered Chicago, this year, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnaces.)

Lake Superior charcoal	$18.00 to 19.25
Northern foundry No. 2	16.00 to 16.75
Southern foundry No. 2	16.10 to 16.35
Jackson co. silveries, 8 per cent	21.40
South'n silveries, 5 per cent sil.	18.35
Alabama basic	17.85
Malleable	16.00 to 16.50

PHILADELPHIA

(Prompt and second quarter shipment delivered to consumer's plants, in Philadelphia and vicinity, unless otherwise specified.)

Northern No. 1X foundry	$17.00 to 17.25
Northern No. 2X foundry	16.50 to 17.00
Northern No. 2 plain	16.25 to 16.50
Standard forge (Eastern, Pa.)	15.75 to 16.00
Virginia No. 2X	17.30 to 17.80
Southern No. 2	16.25 to 16.50
Standard low phos. Phila.	23.50
Malleable	17.75 to 18.00
Basic (Eastern & Central Pa.)	16.50

NEW YORK

(Prompt and second quarter delivery, prices based at Jersey City and tidewater.)

Northern No. 1X foundry	$17.00 to 17.25
Northern No. 2X foundry	16.50 to 17.00
Northern No. 2 plain	16.25 to 16.50
Virginia No. 2X	17.30 to 17.55
Southern No. 2	16.50 to 17.00
Malleable	17.50 to 17.75
Gray forge	16.00 to 16.25

ST. LOUIS

(Throughout this year.)

Southern No. 1	$16.00 to 16.50
Southern No. 2	15.50 to 15.75
Southern No. 3	15.00 to 15.50
Southern No. 4	14.75 to 15.00

(Freight, Birmingham to St. Louis, $3.75)

BIRMINGHAM

(For southern delivery.)

No. 1 foundry	$12.50
No. 2 foundry	12.00
No. 3 foundry	11.50
No. 4 foundry	11.00 to 11.50
Gray forge	10.75 to 11.25
Mottled	10.50 to 11.00
Standard basic	12.00 to 12.50
Off basic	11.00 to 11.50
Charcoal	25.00 to 25.50

BUFFALO

(Through this year, delivered in city.)

No. 1 foundry	$15.75 to 16.00
No. 2X foundry	15.50 to 15.75
No. 2 plain	15.50
No. 3 foundry	15.25 to 15.50
Gray forge	15.25
Malleable	16.00
Basic	16.25 to 17.00
Charcoal	18.00 to 19.00

Ferro Alloys

English 80 per cent ferro-manganese, $59 to $61, seaboard, early and forward.

Fifty per cent ferro-silicon on contracts, $75, Pittsburgh, or Philadelphia, for carloads; $74 for larger lots and $73 for 600 tons or more. Twelve to 13 per cent, $26. Eleven to 12 per cent, $25. Ten to 11 per cent, $24. Nine to 10 per cent, $23, f. o. b. Globe, Jisco and Ashland furnace. Freight to Pittsburgh, $1.90.

Ferro-carbon titanium 8 cents per pound for carload lots; 10 cents per pound for 2,000-pound lots and over; 12½ cents per pound in lots up to 2,000 pounds.

Freight rates on ferro-manganese, foreign spiegeleisen and electrolytic ferro-silicon from Baltimore to Pittsburgh, $2.16; to Youngstown, $2.48; to Cleveland, $2.57; to Detroit and Columbus, $2.99; to Cincinnati, $3.40; to Chicago and Milwaukee, $4.00. Freights from Philadelphia and New York, 10 and 30 cents higher respectively.

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds, to:—

New York	16 cents
Philadelphia	15 cents
Boston	18 cents
Buffalo	11 cents
Cleveland	10 cents
Cincinnati	15 cents
Chicago	18 cents
St. Louis	22½ cents
Denver	84½ cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast, shapes and plates	80 cents
Pacific coast, sheets, No. 11 and heavier	80 cents
Pacific coast, sheets, Nos. 12 to 16	85 cents
Pacific coast, sheets, No. 16 and lighter	95 cents
Pacific coast, wrought pipe and boiler tubes	65 cents

Coke

AT THE OVENS.

	Prompt shipment.	Contract.
Connellsville district:		
Foundry coke	$2.85 to 3.25	$3.00 to 3.25
Furnace coke	2.00 to 2.25	2.50
Wise county district:—		
Foundry coke	$2.75 to 3.00	$2.75 to 3.00
Furnace coke	2.15 to 2.50	2.25 to 2.50
Pocahontas district:—		
Foundry coke	$2.75 to 3.00	$2.75 to 3.00
Furnace coke	2.25 to 2.50	2.50
New River district:—		
Foundry coke	$3.25 to 4.00	$3.25 to 4.00
Furnace coke	2.50 to 2.60	2.60 to 2.90

Iron Ore

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, $4.40; Mesabi Bessemer, $4.15; old range non-Bessemer, $3.60; Mesabi non-Bessemer, $3.40; all at lower lake ports.

Foreign iron ores, 7½ to 8 cents per unit, f. o. b. cars eastern seaboard. Freight rates from Philadelphia to eastern Pennsylvania, furnace points range from 35 to 75 cents per ton.

Billets and Sheet Bars

PITTSBURGH

For prompt and forward delivery, Bessemer 4 x 4 billets with 0.25 carbon and less, $27 to $27.50; open-hearth rolling billets, $27 to $27.50; Bessemer sheet and tin bars, $27.50; open-hearth sheet bars, $27.50, f. o. b. Pittsburgh and Youngstown. Forging billets, $35, Pittsburgh.

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity: 4 x 4-inch open-hearth and Bessemer rolling billets at $28 to $30, and forging billets at from $35 to $36.

Standard Shapes

PITTSBURGH

Standard structural shapes, 1.45c to 1.50c for forward shipment. For extras see card of Sept. 1, 1909.

CHICAGO

Standard structural shapes, 15 inch and under, 1.63c to 1.68c.

PHILADELPHIA

Delivered to consumers in Philadelphia and vicinity. Standard structural shapes from Eastern Pennsylvania mills on contract 1.60c to 1.65c; for prompt delivery, 1.60c to 1.70c. From Pittsburg mills 1.60c.

NEW YORK

Standard structural shapes for second quarter delivered at New York by eastern Pennsylvania makers 1.61c to 1.66c. On third quarter and last half contracts, Pittsburgh district makers are quoting from 1.61c to 1.66c, New York.

Plates

PITTSBURGH

Standard steel plates ¼ inch thick, 6¼ to 100 inches, 1.45c to 1.50c for forward shipment and 1.50c to 1.60c for prompt shipment. For extras, see card of Sept. 1, 1909.

CHICAGO

Tank plates, 1¼ inch thick, 6⅝ to 100 inches wide, 1.63c to 1.68c.

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity. Tank plates from eastern Pennsylvania mills for prompt or contract delivery 1.75c; universal plates 1.75c to 1.80c. From Pittsburgh mills, tank and universal plates 1.60c to 1.65c.

NEW YORK

Steel plates, tank quality, for second quarter delivery at New York by eastern Pennsylvania makers, 1.76c. On small lots of universal plates $1 extra asked by some makers; on third quarter and last half contracts,

Pittsburgh makers are quoting 1.61c to 1.66c, New York.

Sheets and Tin Plate

PITTSBURGH

No. 28 black	2.35c
No. 28, tin mill black	2.30c
No. 28, galvanized	3.40c to 3.50c
No. 10 blue annealed	1.75c
Painted corrugated	2.55c
Galvanized corrugated	3.55c
Tin plate, 100 pound cokes	$3.60

PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity: No. 10 gage annealed sheets at 1.90c.

Pipe and Boiler Tubes

PITTSBURGH

	Black.	Galv. Butt weld.
Steel, ¾ to 3 inches	79½	71
Iron, ¾ to 2½ inches	73	62
BOILER TUBES.		
Steel, 3½ to 4½ inches	70	..
Iron, 3½ to 4½ inches	58	..

Other sizes of pipe and tubes take the usual advances as per official boiler tube cards.

Rails and Track Material

PITTSBURGH

Steel rails, 50-pound and heavier, 1.25c per pound; carload less than 500 tons 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.25c, schedule on the other weights being irregular and subject to negotiations; angle bars for standard sections, 1.50c, base, Pittsburgh; track bolts, 2.40c to 2.50c base, Pittsburgh.

Railroad spikes, 4½, 5 and 5½ and 9-16 inch, 1.80c.

CHICAGO

Light rails, carloads, 25 to 45-pound, 1.25c, base; 16 to 20-pound, 1.30c; 12-pound, 1.35c; 8-pound, 1.40c.

Light section relayers, 45 pounds and under, subject to inspection, $22 to $23; standard section relaying rails, subject to inspection, $23 to $24.

Track fastenings f. o. b. Joliet:

Angle bars, 1.50c; railroad spikes, 1.90c to 1.95c; smaller size spikes, 2.05c, base; track bolts with square nuts, 2.30c to 2.40c.

Bars, Hoops and Bands

PITTSBURGH

Common iron bars, 1.70c to 1.80c, Pittsburgh; Bessemer and open-hearth steel bars, 1.40c; plow and cultivator 1.40c; channels, angles, zees, tees, under 3 inch, 1.50c, all f. o. b. mill.

Hoops in carload lots, 1.60c, Pittsburgh, in less than carload lots, 1.65c; bands, 1.40c, base, with net extras, as per standard steel.

Cold rolled and ground shafting, 60 and 58 per cent off in carloads and 55 and 53 per cent in less than carloads delivered in base territory.

CHICAGO

Bar iron 1.57½c to 1.62½c; hard steel bars, rerolled, 1.65c to 1.75c; soft steel bars, bands and small shapes, 1.58c; hoops, 1.63c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting, 58 per cent off list for carload lots, 53 per cent off for less than carloads.

PHILADELPHIA

Delivered in consumers' plants in Philadelphia and vicinity: Steel bars 1.55c to 1.60c on contract and common bar iron, 1.55c to 1.60c. Prompt steel bars on mill shipments, 1.85c to 1.90c, delivered. Cut nails 1.90c to 1.95c, Philadelphia. Shafting 58 and 53 off in base territory.

NEW YORK

Delivered in New York, steel bars on contract from 1.56c to 1.61c, and common iron bars, 1.52c to 1.60c.

Bolts, Nuts and Rivets

Rivets

Button head structural rivets, 2.15c to 2.20c, Pittsburgh, cone head boiler rivets, 2.25c to 2.30c. Small rivets, 75, 10 and 10 off.

Structural rivets, Chicago, 2.08c to 2.18c; boiler rivets, 0.10c extra.

Bolt and Nut Discounts

(Delivered within a 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, smaller and shorter, rolled threads, 75 and 10; cut threads 75 and 5; larger and longer, 70 and 2½.

Machine bolts with hot pressed nuts, ⅜ x 4 inches, smaller and shorter, rolled 75, 10, and 5; cut, 75 and 10; larger and longer, 70 and 7½.

Gimlet and cone point lag or coach screws, 80 and 10.

Hot pressed square, blank or tapped nuts, $5.70 off list; hot pressed hexagon blank or tapped, $6.30.

Cold pressed C. & T. square, blank or tapped, $5.70 off; hexagon, blank or tapped, ⅝-inch and larger, $6.60 off; ½-inch and smaller, $7.20 off.

Wire Products

PITTSBURGH

Wire nails, jobbers' carload lots, $1.80, retailers' carload lots, $1.85, cut nails (western makers), jobbers' lots, $1.70; painted barb wire, jobbers' carload lots, $1.80; retailers' carload lots, $1.85, with 40c for galvanizing; plain wire to jobbers in carloads, $1.60; and to dealers in carloads, $1.65; polished staples, $1.80; galvanized staples, $2.20.

CHICAGO

Wire nails, jobbers' carload lots, $1.93 to $1.98; retailers' carload lots, $1.98 to $2.05; retailers' less than carload lots, $2.03 to $2.08; painted barb wire, jobbers' carload lots, $1.93 to $1.98; retailers' carload lots, $2 to $2.05; retailers' less than carload lots, $2.03 to $2.08, with 40c for galvanizing; plain wire, jobbers, carload lots, $1.73; retailers' carload lots, $1.78.

Cast Iron Pipe

CHICAGO

Four-inch water pipe, $28.00; 6 to 12 inches, $27.00; larger sizes, $25.00; gas pipe, $1 a ton higher.

NEW YORK

Six-inch pipe, 30 pounds to the foot, $23 to $25, f. o. b. New York, in carload lots.

BIRMINGHAM

Water main: 4-in., $22.50; 6-in. and up, $20.50. Gas main: $1 per ton higher than water main. Special fittings, $45 to $47.50.

Old Material

PITTSBURGH

Gross tons delivered.

Heavy melting scrap	$13.75 to 14.00
Rerolling rails	16.00 to 16.50
Malleable	13.00 to 13.50
Agricultural malleable	12.75 to 13.00
Bundled sheet scrap	10.00 to 10.50
Iron axles	25.50 to 26.00
Old iron rails	15.50 to 16.00
Stove plate	10.00 to 10.25
No. 1 wrought scrap	15.00 to 15.25
Old car wheels	14.50 to 14.75
Low phosphorus	16.00 to 16.25
Machine shop turnings	7.75 to 8.00
No. 1 busheling	12.75 to 13.00
Cast borings	9.75 to 10.00
No. 1 cast scrap	14.25 to 14.50

PHILADELPHIA

Gross tons delivered to consumers' plants in eastern Pennsylvania and western New Jersey:

Old iron rails	$17.50 to 18.00
Old steel rails (rerolling)	15.00 to 15.50
No. 1 heavy melting steel	12.00 to 12.50
Old car wheels	13.50 to 14.00
Old iron axles (nominal)	26.00 to 27.00
Old steel axles	17.50 to 18.00
No. 1 railroad wrought	14.50 to 15.00
Wrought pipe	12.00 to 12.50
Cast borings	8.50 to 9.00
Machine shop turnings	8.50 to 9.00
Heavy cast (broken)	13.25 to 13.75
Malleable	12.50 to 13.00
Stove plate	10.00 to 10.50
No. 1 forge	11.00 to 11.50
Low phosphorus	16.25 to 16.75

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

CLEVELAND

Gross Tons

Old iron rails	$15.50 to 16.50
Old steel rails (under 3 ft.)	13.50 to 14.00
Old steel rails (over 6 ft)	13.50 to 14.00
Relaying rails	23.00 to 25.00
Old steel boiler plate	10.00 to 10.50
Malleable iron (railroad)	13.00 to 13.50
Axle turnings	9.50 to 10.00
Steel axles	9.00 to 9.50
Malleable iron (agricultural)	11.50 to 12.00
Heavy steel	11.75 to 12.25
Country mixed steel	10.00 to 10.50
Bundled sheet scrap	9.00 to 9.50

Net Tons

No. 1 R. R. wrought	$12.00 to 12.50
No. 1 busheling	10.25 to 11.00
No. 1 machine cast	12.00 to 12.50
No. 1 dealers' wrought	9.50 to 10.00
Machine shop turnings	4.75 to 5.00
Pipes and flues	8.00 to 8.50
Wrought drillings	4.75 to 5.00
Cast borings	6.50 to 7.00
Stove plate	7.75 to 8.25
Wrought iron arch bars	15.00
Wrought iron piling plate	16.00 to 16.50

CHICAGO

(Delivered in consumers' yards.)

Gross Tons.

Old car wheels	$15.00 to 15.50
Old iron rails	16.00 to 16.50
Rerolling rails (5 ft. and over)	14.00 to 14.50
Old steel rails (3 ft. and und.)	12.00 to 12.50
Frogs, switches and guards	11.00 to 11.50
Heavy melting steel	11.00 to 11.50
Shoveling steel	10.75 to 11.25

Net Tons.

No. 1 R. R. wrought	$11.00 to 11.50
No. 2 R. R. wrought	10.50 to 11.00
Arch bars and transoms	15.00 to 15.50
Knuckles, couplers and springs	11.25 to 11.75
Shafting	15.50 to 16.00
Iron car axles	20.75 to 21.25
Steel car axles	17.50 to 18.00
Locomotive tires	12.00 to 12.50
Dealers' forge	10.50 to 11.00
Pipe and flues	8.50 to 9.00
No. 1 cast	11.75 to 12.25
No. 1 busheling	9.25 to 9.75
No. 2 busheling	7.00 to 7.25
No. 1 boiler cut	8.25 to 8.75
Boiler punchings	12.00 to 12.50
Cast and mixed borings	5.25 to 5.75
Machine shop turnings	5.75 to 6.25
Railroad malleable	12.75 to 13.25
Agricultural malleable	11.00 to 11.50
Angle bars, splices, etc., iron	14.50 to 15.00
Angle bars, steel	10.50 to 11.00
Stove plate and light cast scrap	10.00 to 10.50

NEW YORK

Gross tons, New York dealers' prices at tidewater, usually for Eastern Pennsylvania delivery:

Old car wheels	$11.50 to 12.00
Steel axles	15.75 to 16.00
Old steel shafting	14.50 to 14.75
No. 1 heavy melting steel	10.25 to 10.50
No. 1 R. R. wrought	13.00 to 13.50
Wrought pipe (not galvanized)	9.50 to 9.75
Cast borings	6.50 to 7.00
Machine shop turnings	6.50 to 7.00
Heavy cast	11.25 to 11.50

Stove plate	8.00 to 8.25
Grate bars	7.25 to 7.50

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City, and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City, and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City, and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City, and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York; to Jersey City, $1.00 from New York; to Newark, $1.10 from New York.

CINCINNATI

Gross Tons.

Old iron rails	$12.50 to 13.00
Old steel re-rolling	11.00 to 11.50
Old iron axles	17.00 to 17.50
Heavy melting scrap	10.50 to 11.00
Relaying rails	19.75 to 20.25
Bundled sheet scrap	7.25 to 7.75

Net Tons.

Old No. 1 R. R. wrought	$10.00 to 10.50
No. 1 yard wrought	7.75 to 8.25
No. 1 machine cast	10.25 to 10.75
No. 1 busheling	8.50 to 9.00
Stove plate	8.00 to 8.50
Machine shop turnings	6.00 to 6.50
Cast borings	5.75 to 6.25
Heavy turnings	6.25 to 6.75
Mixed cast	8.75 to 9.25
Breakage	6.50 to 7.00
Malleable	8.00 to 8.50

BIRMINGHAM

Old iron axles, (light)	$15.00 to 15.50
Old steel axles, (light)	15.00 to 15.50
Old iron rails	13.50 to 14.00
No. 1 R. R. wrought	12.00 to 12.50
No. 2 R. R. wrought	10.00 to 10.50
No. 1 country wrought	9.50 to 10.00
No. 2 country wrought	8.50 to 9.00
No. 1 machinery cast	10.00 to 10.50
No. 1 steel scrap	10.50 to 11.00
Tram car wheels	10.50 to 11.00
Standard car wheels	12.00 to 12.50
Light cast and stove plate	8.50 to 9.00

BUFFALO

Heavy melting steel	$12.00 to 12.75
No. 1 R. R. wrought scrap	14.00 to 14.50
No. 1 R. R. and mch. cast scrap	13.75 to 14.25
Old steel axles	17.50 to 18.00
Car wheels	15.00 to 15.50
Railroad malleable scrap	13.25 to 13.75
Wr'ght iron and soft steel turn.	8.25 to 8.50
Cast iron borings	8.00 to 8.50
Low phos. steel scrap	17.00 to 17.50
Old iron rails	15.00 to 15.50
Boiler plate, sheared	15.00 to 15.50
Stove plate (net ton)	9.75 to 10.00
Locomotive grate bars	10.50 to 11.00
No. 1 busheling scrap	11.50 to 12.00
No. 2 busheling scrap	9.00 to 9.50

ST. LOUIS

(Dealers' buying prices.)

Gross Tons

Old car wheels	$13.50 to 14.00
Old iron rails	13.00 to 13.50
Rerolling rails (5 ft. and over)	13.25 to 13.50
Old steel rails (3 ft. and under)	12.50 to 12.75
Light sec. relayers (45 pounds and under) subject to inspec.	23.50 to 24.50
Relaying rails, subject to inspec.	23.50 to 24.50
Frogs, switches and guards	11.25 to 11.50
Heavy melting steel	11.25 to 11.50
Shoveling steel	9.25 to 9.75

Net Tons

No. 1 railroad wrought	$11.00 to 11.50
No. 2 railroad wrought	10.50 to 11.00
Arch bars and transoms	13.50 to 14.00
Knuckles, couplers, springs	10.00 to 10.50
Shafting	13.50 to 14.00
Steel car axles	17.50 to 18.00
Iron car axles	21.00 to 21.50
Locomotive tires	11.00 to 11.50
Pipe and flues	6.50 to 7.00
Tank iron and cut boilers	6.50 to 7.00
No. 1 cut busheling	9.50 to 10.00
No. 2 cut busheling	7.50 to 7.75
Cast and mixed borings	6.25 to 6.75
Machine shop turnings	7.25 to 7.75
Railroad malleable	10.50 to 11.00
Agricultural, malleable	9.00 to 9.50
Stove plates	8.00 to 8.25
Angle splice bars (iron)	12.50 to 13.00
Angle splice bars (steel)	11.00 to 11.25

Store Prices

CINCINNATI

Steel bars, 2.10c; iron bars, 2c; plates and shapes, 2.20c; sheets, blue annealed No. 10, 2.40c; black, No. 28, 2.85c; galvanized, No. 28, 3.95c; cold rolled shafting, round, square, hexagon and flat, 50 off.

CLEVELAND

Steel bars, 2.10c; plates and shapes, 2.25c; iron bars, 2.05c; sheets, No. 10 blue annealed, 2.40c; No. 28 black, 2.85c; No. 28 galvanized, 3.95c.

CHICAGO

Steel bars, 1.95c; iron bars, 1.95c; hoops, 2.50c; shapes and plates, 2.05c; No. 10 blue annealed sheets, 2.25c; black, No. 28, 2.90c; galvanized, No. 28, 4.15c.

PHILADELPHIA

Steel bars 2.05c to 2.10c; structural shapes, 2.00c to 2.10c; plates, 2.00c to 2.10c.

NEW YORK

Steel bars, 2.05c; structural shapes, 2.15c; plates, 2.15c.

Name Receiver for Mill

Lewis N. Lukens and Louis M. Childs have been appointed by the courts of Norristown, Pa., receivers for the Longmead Iron Co., of Conshohocken, Pa. This plant, which is equipped for the manufacture of small wrought iron pipe, iron skelp and muck bars has been idle since August 1911. The receivers were appointed at the request of the estate of Jawood Lukens, principal stockholder of the company. This estate owns 2,558 of the 4,000 shares of the common and 651 of the 1,000 shares of preferred stock and is a creditor of the company for $26,170.

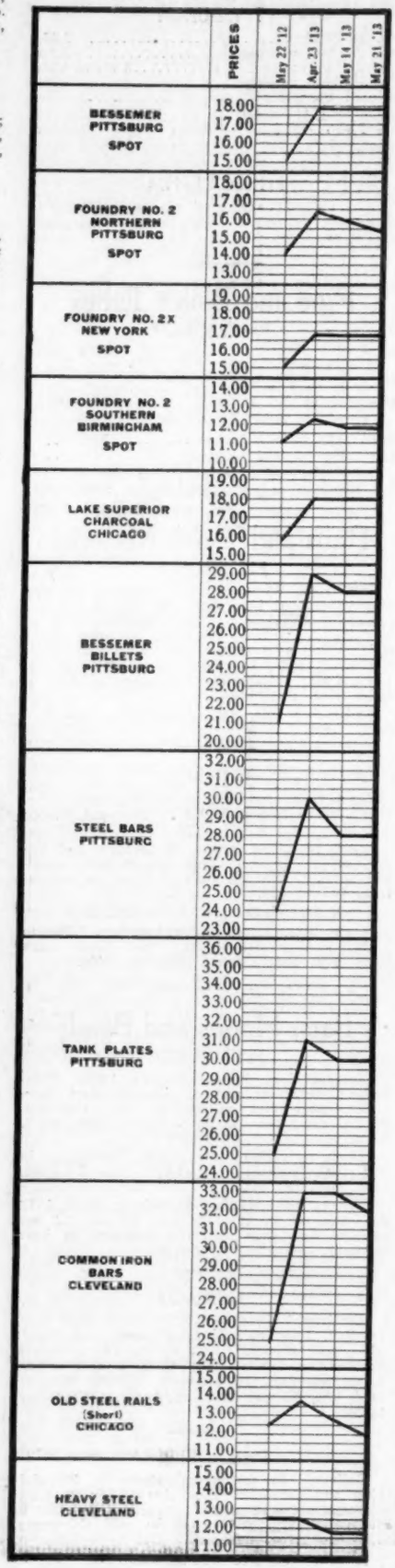
Electric Line Building

Construction work has begun on an electric line to extend from Cleveland to Youngstown, O., which, when completed, is estimated to cost $5,000,000. The plans include the erection of a terminal station and depot and the construction of a 4,000-foot tunnel in Cleveland. The project is financed by a syndicate, headed by W. S. Hayden, president of the Cleveland Chamber of Commerce.

Fuller May Resign

Cincinnati, May 21. (By wire.)—It is understood that E. C. Fuller, purchasing agent of the United States Pipe & Foundry Co., will resign, June 1, and that the office will be moved from Columbus to Philadelphia. Mr. Fuller will remain a director of the Pipe company.

PRICE CHART



THE ABC OF IRON AND STEEL

The Manufacture of Open-Hearth Steel--II

By Kenneth Seaver

THE ports of an open-hearth furnace always are located so that the air, being heavier, shall enter above and outside the gas; the two then are deflected downward by the alignment of the ports and spread and mingle at the port ends, combustion takes place at that point and the flame is distributed over the entire bath. The air being above the gas, protects the roof from the intense heat generated, while the gas underneath prevents the air from directly striking the stock, thereby avoiding undue oxidation. The ports usually are so aligned that they will cause the gas and air to meet at from 3 to 5 feet above the bath. The gas and air ports, together with the downtakes, which are the vertical flues leading from the ports to the gas and air chambers, form merely an ordinary gas burner on a large scale, and from this point of view the necessary and frequent adjustments as to admission of gas and air appear simple.

Illustrative of how a slight irregularity in the ports may cause serious trouble, however, is the case of an open-hearth furnace roof which was burned out at one point after 16 heats. A silica bat left lying in the gas port was found to have caused the trouble. It directed an eddy of gas onto the roof at which point it quickly was burned through. The ports and surrounding brickwork generally are built of silica brick. Among other devices to prolong the life of the port which has a tendency to cut away rapidly, is water-cooling by

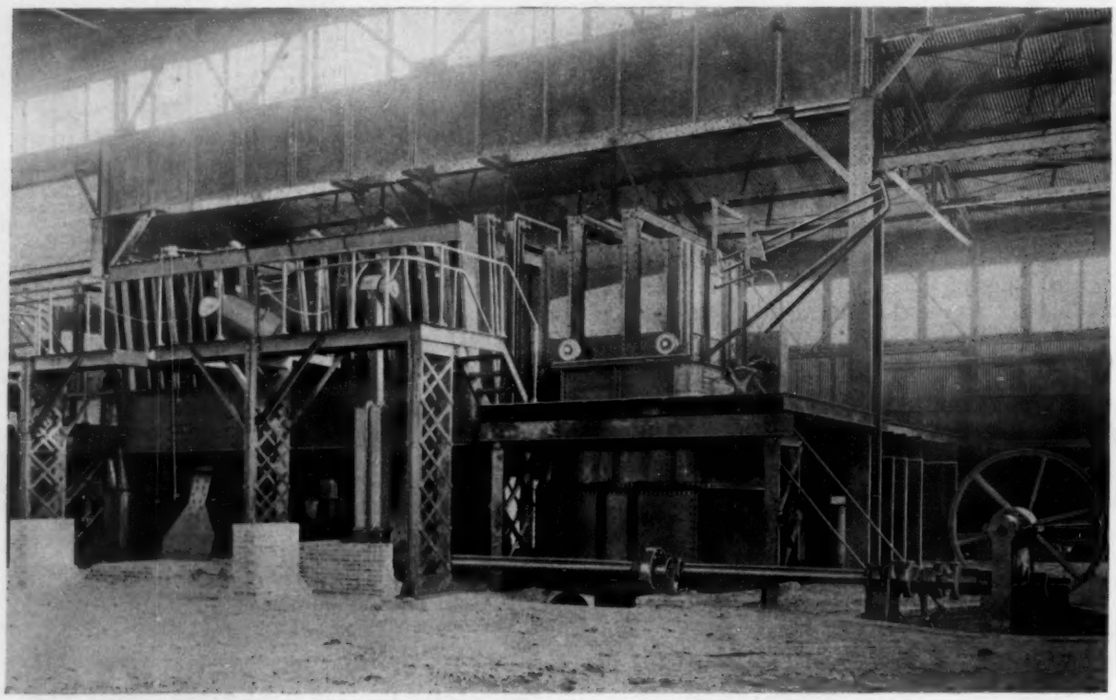
CASTING STEEL FROM AN OPEN-HEARTH FURNACE INTO A LADLE CAR. THIS PRACTICE IS ALMOST OBSOLETE IN THE UNITED STATES

bronze plates protected by one or more courses of magnesia or chrome brick. Another type has water-cooled pipes embedded in the port arch. This is built of ground magnesite or chrome ore rammed over forms, the arch being supported by the pipes. Paving the port with magnesia brick or fine chrome ore and daubing the face with ore, seem to be among the most satisfactory methods of prolonging the life of the port.

Gas and air chambers or regenerators, formerly located directly underneath the furnace, now nearly always are separated from the furnace proper. Furnace operators claim that the former arrangement insured more rapid working, but with the regenerators directly underneath the furnace, repairs are more difficult to make. Furthermore, it is more difficult to keep the brickwork gas and air-tight, and in case of a break-out, resulting in the metal flowing directly into the checkers, a considerable delay in operations is occasioned and an enormous expense is entailed. In the older types of furnace, gas and air chambers frequently were practically the same size, but in newer designs the air space is larger and in the proportion of about 1 1/3 to 1, which is correct for proper combustion.

The exact proportions of the chambers are not so important, except that they should be of ample size; their cubical contents, however, are not the only factors, determining their successful operation. It is the customary practice to build the chamber of greater height than width, as the gases have a tendency to rise and more uniform draft is secured than if the gases travel along horizontal passages. For a 60-ton furnace the height of the chamber should be 13 to 18 feet with a capacity of about 90 cubic feet per ton of steel.

Flues formed of regenerator or girder tile support the checkerwork of standard 9-inch brick or other shape, forming a series of vertical flues with openings approximately 3½ to 4 inches. While large heating surface is desirable in checker-work, this should not be overdone by reducing the openings between the brick. If unduly reduced, such openings will clog rapidly with flue dust. In some furnaces a large checker, 10½ x 4½ x 4½ inches, capable of being used many times, has been introduced, but it is claimed by some operators that the large checker is inefficient because its interior does not become sufficiently heated or cooled between the reversals of the gas and air and for this reason a small checker is more desirable. In many instances, first quality clay brick is used for checkers, although in some plants clay with 10 or 12 top courses of silica brick is employed, while a constantly increasing number of operators use silica brick throughout. It is claimed that the latter clog less rapidly than clay brick and do not as quickly take on a carbon coating. A wash of fine chrome ore on the checkers protects them somewhat from accumulations of slag, etc. As an improvement on silica brick, some furnacemen use five or six top courses of magnesia brick. Magnesia and silica top courses undoubtedly permit the heats to be taken off



ELECTRICALLY-OPERATED, 20-TON WELLMAN TILTING FURNACE IN MELTING POSITION

somewhat more rapidly. The use of the best quality of checker brick is an economy. First quality clay or silica brick should be used for the walls and arches. Silica brick expands, thereby holding everything tight as the furnace is heated. In case these bricks spawl during temperature changes, an inner course of clay brick will be found advantageous, as they will conduct the heat gradually to the silica brick.

Slag pockets, which are practically enlargements of the flues leading from the checker chambers to the uptakes and ports, serve to intercept fine particles of ore, slag and limestone and take the slag if the furnace boils excessively. These pockets usually are arranged with clean-out doors and they also obviate the frequent cleaning of the checkers. Care in manipulation, and opening the furnace doors to cool the bath if necessary, minimize any trouble of this kind.

Uptakes are vertical flues from the ports to the slag pockets and are lined with first quality clay brick, although latter-day practice provides for the use of silica brick. In many plants the best results are being obtained from the use of magnesia brick, especially behind ports where the gases strike the wall. Horizontal flues, a continuation of the uptakes, lead from the slag pockets to the checker chambers and thence to the stack.

Gas and air enter the flues through a throttle valve and a reversing valve controls the reversal of the currents. The Siemens or butterfly valve largely is employed. It is low in cost and easy to install, but it is liable to warp as a result of the effect of the hot gases on one side. Frequently, also, leakage occurs due to deposits of soot and tar on the valve seats. These and other defects have induced improvements in types of water-sealed valves.

The damper, which is a rectangular plate loosely fitting in a frame set in the flues, is used to secure a uniform distribution of heat when the chambers become choked with dust, thereby preventing one chamber from working hotter than another. The stack should have ample draft, it being easy to damper-down, while insufficient draft means poor working of the furnace.

The tilting or rolling type of open-hearth furnace may be rotated through an arc of many degrees. One type revolves on a nest of rollers, the axis of revolution being coincident with a line drawn through the center of the ports which take gas and air irrespective of the position of the furnace. Another type, in pouring, breaks the port connections. Tilting furnaces obviate many difficulties attendant upon stationary furnace operations. The tap hole requires only light tamping, as it is located above the metal and slag line. The life of the bottom is prolonged as it can be drained entirely of metal and slag and the back wall can be readily patched, while a slight tilt will prevent the metal from flowing through the doors when frothing occurs.

The fuels employed in open-hearth practice include natural and artificial gas and oil. Nat-

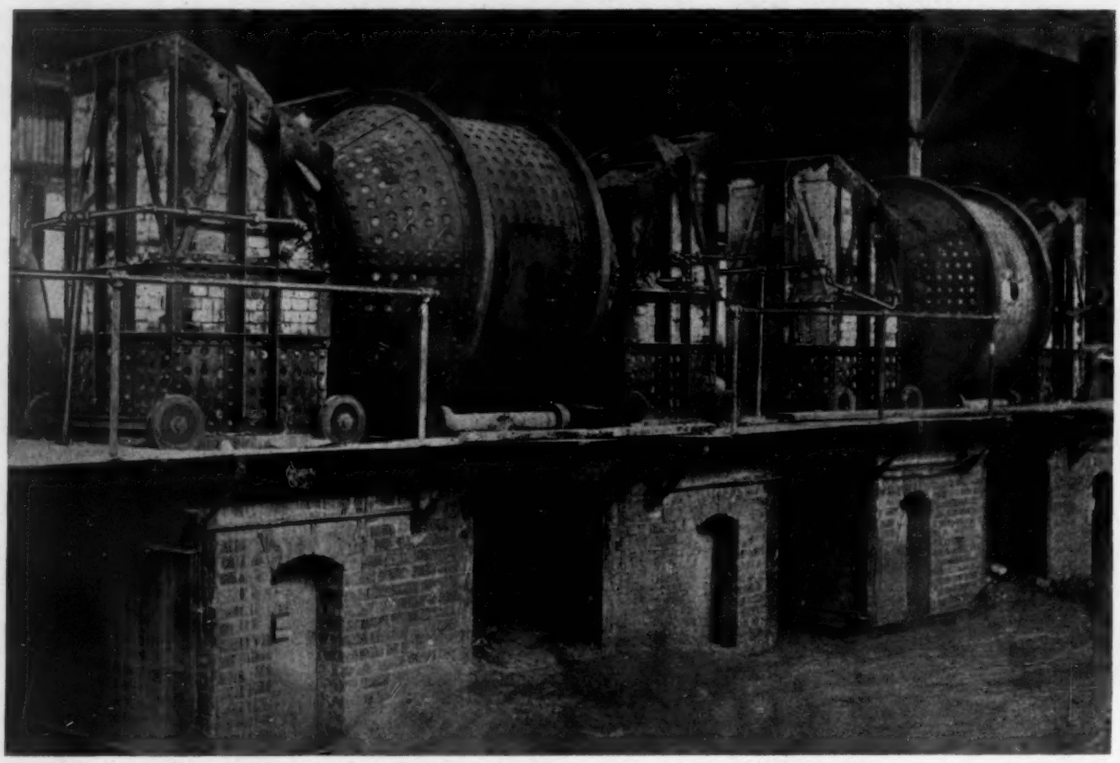
HYDRAULICALLY-OPERATED, 20-TON WELLMAN TILTING FURNACE IN TAPPING POSITION

ural gas is the best fuel that can be used, owing to its low cost, high calorific value, absence of sulphur and it requires no pre-heating. When first used an effort was made to pre-heat it, but owing to its high percentage of hydrocarbons, a vitreous coke formed in the checkers, thereby clogging them. A comparison of average analyses of natural and producer gas, showing the superiority of the former, follows:

Constituent.	Per Cent		
Carbon dioxide	0.40	0.45	5.7
Carbon monoxide	1.70	1.85	22.0
Oxygen	1.80	0.00	0.4
Ethylene	1.40	1.55	0.6
Ethane	12.95	14.20	0.0
Methane	68.85	75.35	2.6
Hydrogen	.....	.....	10.5
Nitrogen	12.90	6.60	58.2
Calorific value in B. T. U. per cubic foot			

not contain too much sulphur, preferably not over 1 per cent. However, the allowable proportion of sulphur depends upon the form in which it occurs in the coal. A small amount may be excessive if it is in such a state that it will readily volatilize and contaminate the gas. In this case it is rapidly absorbed by the steel.

By reference to the foregoing analyses of natural and producer gas, it will be noted that the comparatively low calorific value of producer gas is due to the large amount of inert nitrogen unavoidably admitted with the air. Oil is an excellent open-hearth fuel. It can be vaporized by steam or air blast and requires no pre-heating. In addition, it is of high calorific value, regular in quality and the furnace can be operated uniformly. However, its flame is sharp and unless due care is exercised, the roof will be cut out and the metal in the bath



TWO OPEN-HEARTH FURNACES OF THE CARR DETACHABLE TYPE

The above analyses are by volume, the first column giving the constituents of natural gas taken from a normal line containing 8.65 per cent air, which was the leakage into the main. The second analysis of natural gas shows the results obtained with the air calculated out.

Of the artificial gases, producer is the only one of importance in open-hearth practice. As its name implies, this gas is made in one of the many types of producers now in use. Although a number of different fuels have been used for gas making, bituminous coal is the only one necessary to consider in this connection. Good gas coal is essential, although it should is readily over-oxidized. To a large extent, its employment is determined by local conditions.

The difference in results obtained by the acid and basic processes respectively, is in the removal of the carbon, silicon and manganese within allowable limits by the former, while in basic operations carbon, silicon, manganese, sulphur and phosphorus are removed or reduced. As neither sulphur nor phosphorus is eliminated in the acid furnace, the charge must contain no higher average percentage of these than is permissible in the product and, in fact, it should be somewhat lower. The percentage

of sulphur and phosphorus in the product is increased in the same proportion as the other impurities are eliminated. The charges generally consist of pig iron and scrap, averaging possibly 50 to 75 per cent of scrap and the remainder pig iron, but these proportions vary widely. The scrap utilized varies from crop ends of billets, rails and structural sections to machine shop borings and turnings. Pig iron, suitable for acid practice, contains usually not less than 3 per cent of carbon as a minimum to 4.25 per cent as a maximum. Silicon varies from 1 per cent or less to 2.50 per cent, sulphur not over 0.05 per cent and phosphorus, not to exceed 0.10 per cent.

Representative analyses of pig iron, structural steel and rail scrap employed follow:

Pig iron.—Carbon, 3 to 4 per cent; silicon, 1 to 2 per cent; manganese, under 1 per cent; phosphorus, 0.10 per cent, and sulphur, 0.05 per cent.

Structural steel scrap.—Carbon, 0.20 per cent; silicon, 0.01 per cent; manganese, 0.50 per cent; phosphorus, 0.04 per cent, and sulphur, 0.04 per cent.

Rail steel scrap.—Carbon, 0.45 per cent; silicon, 0.15 per cent; manganese, 0.90 per cent; phosphorus, 0.10 per cent, and sulphur, 0.075 per cent.

The quality and quantity of the scrap and the analysis of the pig determines their proportions in the charge. Pig iron, if very low in silicon, may be used without other additions, although some pig in the charge is essential to prevent the comparatively pure scrap from oxidizing. Pig iron high in silicon, with a small proportion of scrap in the charge, will result in a heavy covering of slag over the bath, thereby preventing its penetration by the heat. A large proportion of scrap in the charge results in the formation of a comparatively small amount of slag and if this is too small the metal is deprived of the necessary protecting envelope, resulting in high oxidation losses, and the heat would be so low in manganese, silicon and carbon that it would be hard to work. In fixing the proportions in the charge, the primary reactions occurring in the removal of carbon, silicon and manganese must be considered, assuming, of course, that the sulphur and phosphorus are within allowable limits. The process throughout is one of oxidation, the carbon oxidizing to carbon monoxide which further oxidizes to carbon dioxide and passes off as a gas. The silicon and manganese oxidize, and with the manganese and iron in the bath, they form a double silicate of manganese and iron, which rises and forms the slag cover. These reactions and the atomic weights showing the proportions of the weights

ONE OF THE CARR FURNACES DETACHED FOR CASTING THE METAL INTO MOLDS. THE MOVEABLE PARTS ARE IN POSITION OVER THE REGENERATORS

involved in these combinations are expressed as follows:

CO+O=CO	Si+2O=SiO$_2$	Mn+O=MnO
12 16 28	28 32 60	55 16 71

For the oxidation of one atom of carbon one atom of oxygen is required, but expressed by weight, because of the difference in their atomic weights, 1.333 parts of oxygen are necessary; similarly, one atom of silicon requires, by weight, 0.143 parts of oxygen and one atom of manganese requires 0.291 parts of oxygen. Expressing this in terms of oxygen, one part of this element oxidizes 0.75 parts of carbon, or 0.875 per cent of silicon, or 3.438 parts of manganese. Since one part of carbon requires 1.333 parts of oxygen and one part of silicon 1.143 parts of oxygen, therefore one part of silicon is equivalent to 1.143 divided by 1.333, which equals 0.857 carbon, that is, so far as the amount of oxygen is concerned. In the same way one part of manganese equals 0.218 parts of carbon.

Figuring the Charge

In figuring the charge, we will assume that pig iron and scrap with the following fairly representative analyses, are used:

Pig iron.—Carbon, 3.5 per cent; silicon, 1.50 per cent, and manganese, 0.70 per cent.

Scrap.—Carbon, 0.20 per cent; silicon, 0.01 per cent, and manganese, 0.50 per cent. Expressing these impurities in terms of carbon, there is in the

Pig Iron

Per cent.	Per cent carbon.
3.5 carbon	= 3.500
1.5 silicon	x 0.857 = 1.285
0.70 manganese	x 0.218 = 0.153
Total	4.938

Scrap

Per cent.	Per cent carbon.
0.20 carbon	= 0.20
0.01 silicon	x 0.857 = 0.008
0.50 manganese	x 0.218 = 0.109
Total	0.317

In other words, we are dealing with pig iron and scrap requiring for the oxidation of its impurities the same amount of oxygen as though the pig iron contained 4.938 per cent carbon and no other impurities, and the scrap, 0.317 per cent carbon and no other impurities. The impurities are eliminated during melting by the oxygen of the flame, while after melting the elimination is augmented by the action of oxides of iron formed during melting and also added after melting has been completed.

Estimating the Carbon

To estimate the charge, it will be assumed that 40 per cent of impurities are to be oxidized during melting. It also will be assumed that soft steel is being made which is to contain about 0.20 per cent carbon when tapped and which should have, when melted, approximately 0.60 per cent carbon. Having pig iron with double impurities in terms of carbon, namely, 4.938 per cent, and scrap containing carbon, 0.317 per cent, the problem is what proportion of these will give an average of 0.60 per cent carbon when 40 per cent of this total carbon already has been oxidized. It is obvious, therefore, that 0.60 equals 100 per cent minus 40 per cent equals 60 per cent, or 0.60 divided by 60 and multiplied by 100 equals 1 per cent, which represents the total impurities expressed in carbon in the charge before melting, this total to be the average carbon from the pig and scrap in the charge. Expressing this in per hundred parts or per cent, we have the following:

Let X = number parts of pig.
100 — X = number parts of scrap.
then 4.938 X = total impurities in pig expressed in terms of carbon.
0.317 (100—X) = total impurities in scrap expressed in terms of carbon.
therefore,
$4.938\ X + 0.317\ (100-X) = 100.$
X = 15 per cent pig.
100 — 15 = 85 per cent scrap.

Order of Charging

Although authorities differ as to the order in which the material is to be charged, it is almost the universal practice to charge the pig iron first, followed by the scrap. Some melters charge a portion of the pig iron, then the scrap, following this with the remainder of the pig. The pig iron usually is placed on the furnace bottom to protect the latter from the oxide of iron formed by the oxidation of the scrap by the flame. This oxide, when it comes into contact with the sand bottom, forms a silicate of iron, which rapidly scorifies the bottom and cuts it away.

When manufacturing soft steel, the charge is so proportioned that practically all of the silicon is oxidized when the charge has been melted and the carbon is reduced approximately 0.60 to 0.80 per cent, this being later still further reduced by the addition of ore. Frequently, the flame is kept smoky by an insufficient air supply to prevent the scrap from oxidizing at the beginning of the heat, but many open-hearth furnace operators favor melting as quickly as possible, even with great oxidation. In a normal heat for soft steel, manganese, silicon and carbon are eliminated in the order in which they are named and in accordance with their relative affinity for oxygen. In American practice, the character of the charge is such that the oxidation of practically all of the manganese and silicon is completed during melting, leaving approximately 0.60 per cent carbon in the bath.

(*To be continued.*)

An Electrically-Driven, Two-High Reversing Mill[1]

Rotating Gables of Novel Design and Construction are Employed for Reversing the Rolls—A Few Side Lights on English Rolling Mill Practice

By Andrew Lamberton

During the past few years the attention of engineers and steelworks owners has been closely directed to the problem of the economical driving of rolling mills, which have in the past, in the majority of cases, been far from satisfactory in this respect, and although the subject is surrounded with many difficulties, great progress has been made and the way cleared for further advance.

As was to be expected, electricity has been much in evidence, and great credit is due to those who have been pioneers in this respect, for the ingenuity they have displayed, and the large measure of success which has attended their efforts. The day, however, has not yet arrived when it can be claimed that, by the universal adoption of electricity as the motive power for driving rolling mills in iron and steel works, the highest economy in operating costs can be attained.

Speaking generally, where steel works are associated with blast furnaces, and perhaps also coking ovens, and an abundant supply of surplus gas is available for producing electric current at a low cost, electrical driving of such mills is clearly indicated, and the question before the engineer then becomes one of the economical design of such plant, both as regards first cost of installation, and economical performance. The greatest difficulty is met with in dealing with reversing mills of the two-high type, where the rolls have to be reversed at each pass, and when these mills are of large size the electrical plant is extremely costly, the reversing mill motors necessary being from 10,000 to 15,000 horsepower, due to their having to start from rest under full load at each reversal.

All engineers may be said to be in agreement, that where rolling mills can be driven by a constant-running motor associated with a heavy flywheel to take the peak loads of rolling, electrical driving is to be preferred, provided of course that the cost of current be low enough.

For small mills rolling light sections and bars, which can be fed to the mills by hand, the three-high continuous-running mill is practically universally adopted, and in such cases the driving of these mills by a motor leaves nothing to be desired. For larger mills rolling bars and sections of heavier type which cannot be fed by hand, and where live roller feed tables and mechanical manipulators are necessary, the three-high type of mill is not so popular in this country, although it must be admitted that on the Continent and in America this type of mill is quite commonly used even for heavy sections. The main objections, however, are the complicated live roller tables which must rise and fall at each pass, and the increased difficulty of manipulating the bars on these rising and falling tables. There is also the further difficulty of the exact setting of three rolls to give accurate sections, together with the multiplication of the guides and guards required in this system. These considerations have caused steel makers in England to prefer the two-high type of reversing mill for such heavy bars and sections,

[1]Presented at the spring meeting of the Iron and Steel Institute.

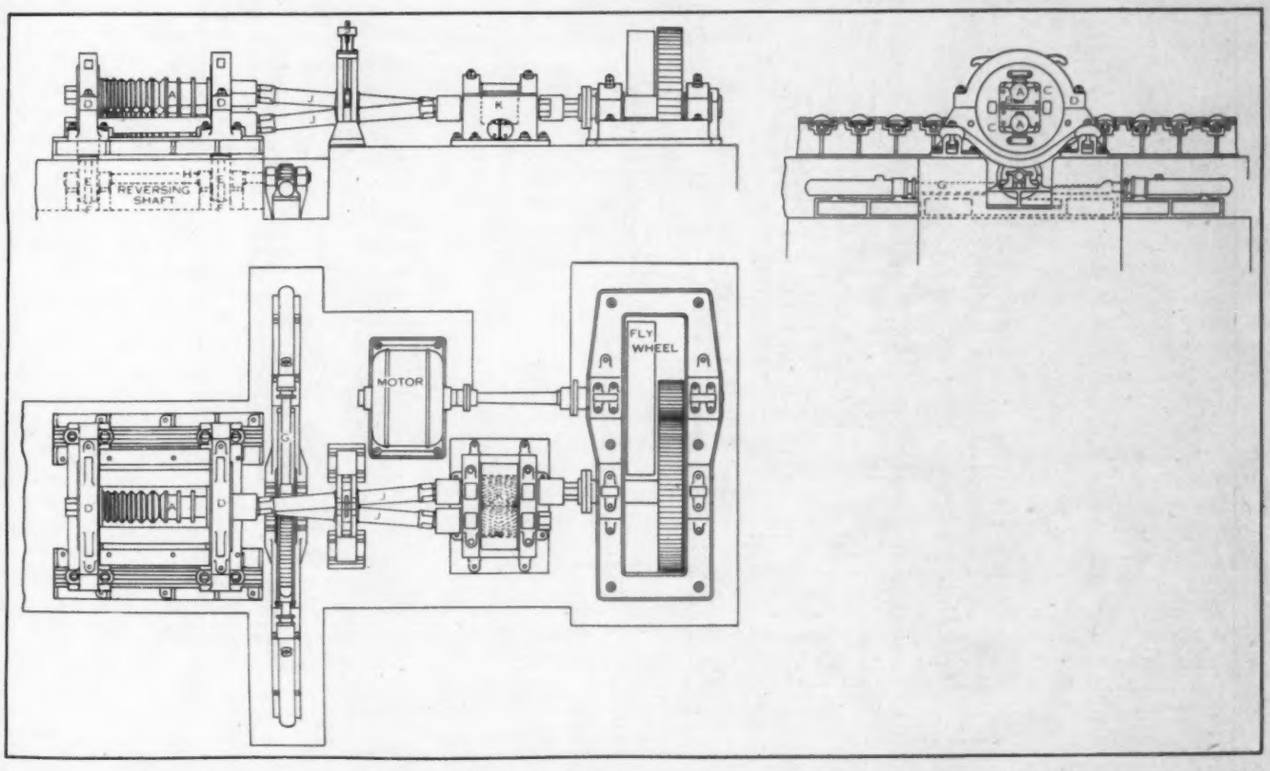


FIG. 1—GENERAL ARRANGEMENT OF TWO-HIGH, CONTINUOUS REVERSING MILL

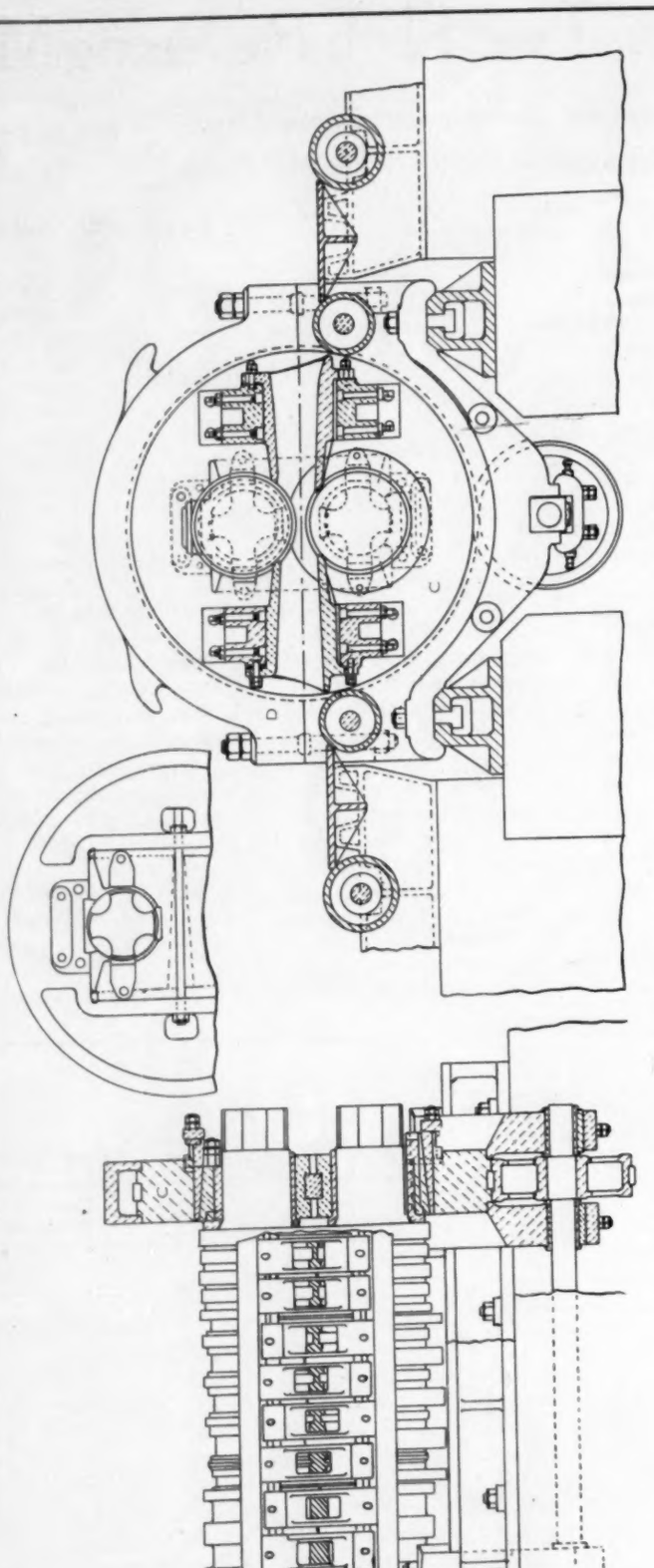


FIG. 2—ENLARGED VIEW OF THE ROTATING GABLES AND FIXED FRAMES

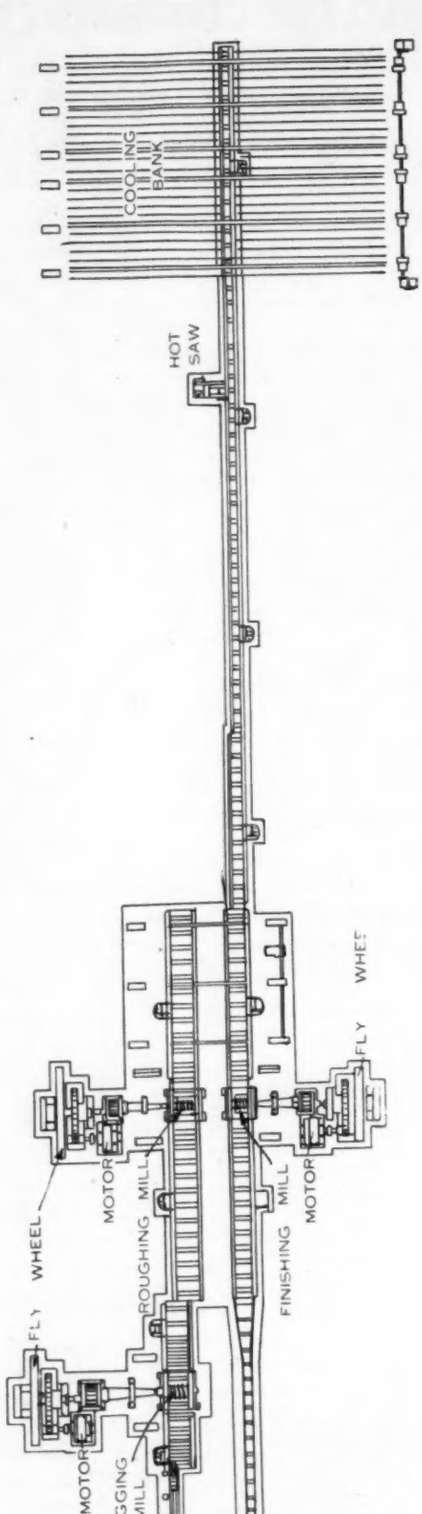


FIG. 3—GENERAL ARRANGEMENT OF A RAIL MILL WITH A CAPACITY OF 5,000 TONS PER WEEK

even although the driving of such mills by reversing steam engines is less economical.

This being so, it occurred to the author that if two-high section rolling mills could be designed so as to be capable of being driven by a continuous-running electric motor, and at the same time give the necessary reversals to the bar at each pass, this would go a long way to meet the difficulties referred to, as the ease of setting the rolls in the two-high mill, and the simplicity of the roller tables being fixed instead of moving, would be conserved, and the large and very costly reversing motor rendered unnecessary. The following is a short description of the method by which this is accomplished:

Basic Principle of Mill

The basic idea of the new system is that, if in a mill with two rolls, arrangements can be made to make the bottom roll the top roll, and vice versa, then at each reversal of the position of these rolls there will be a pass in the opposite direction. If then a pair of rolls be mounted in circular gables which are free to rotate in fixed frames or housings, this will afford a continuous-running two-high mill, which gives reversals at each pass, on the gables being rotated through an angle of 180 degrees—half a revolution.

Rotation of the Rolls

Referring to Fig. 1, the two rolls, *A*, are mounted in the usual form of blocks, *B*, contained in the circular gables, *C*, which are free to rotate in the fixed frames or housings, *D*. In order to make the turning of the gables easy, these are carried on broad revolving anti-friction rollers, *E*, placed immediately under the gables, and carrying the weight of the same. These anti-friction rollers have part of their width formed into a spur pinion, *F*, which gears with corresponding teeth in the rotating gables. By means of an hydraulically-operated rack, *G*, gearing into the pinion on the bottom roller shaft, *H*, the rotation of the gables is quickly effected, the time taken being only three to five seconds, and the stroke of the hydraulic rams is just sufficient to bring the rolls to their exact position at each reversal. To provide for the alternate change in the position of the top and bottom roll, the driving spindles, *J*, conveying the power from the mill pinions, *K*, to the rolls, *A*, are disposed in the manner shown in Fig. 1, and the weight of these spindles is borne up in their center by a balanced carrying gear, the weight of the descending spindle balancing that of the ascending spindle at each reversal. It will be noted that the mill pinions are placed side by side, and not superposed as is usual, as this side-by-side arrangement reduces the angle on the spindles during reversals.

High Speed Motor

With regard to the motor, driving gear and fly-wheel, these are so well understood as to require no description, except to observe that by the employment of a high-speed continuous-running motor the size and cost of such motor is reduced to a minimum; as the flywheel takes the peaks of the rolling loads, the highest economy in operation results.

In Fig. 2 the revolving gables with the fixed frames are shown on a larger scale, and the guides and guards for rail rolling are also shown in position.

An interesting point to observe is, that in rolling rails and sections in the ordinary type of two-high mill, it is necessary to turn the bar upside down to prevent the formation of fins, but this is entirely obviated in this new design of mill, because the rolls take alternately top and bottom position and finning is thereby corrected, so that the turning of the bar upside down is rendered unnecessary, and the operations of rolling simplified.

In Fig. 3 is shown the general layout of a rail rolling mill on this new system, capable of an output of 5,000 tons per week. It will be noted that three distinct mills are shown:

A cogging mill taking the ingot and reducing it to a bloom.
A roughing mill to reduce this bloom to a roughly formed rail; and
A finishing mill to finish the rail to the required section.

These mills are all of the same continuous-running reversing type, the rolls having fixed drafts, so that there is no screwing-down gear required. The live roller tables are all fixed tables of the simplest form, and the manipulation of the ingots at the cogging mill, the blooms at the roughing mill, and the rails at the finishing mill, is of the simplest character.

High-speed continuous-running electric motors with suitable flywheels are used to drive each of these mills.

First Installation

The first mill of this new type is now in course of construction, and will be operated in a large steel works in England in the early summer, when the results in every-day operation will be available.

There is, however, another side to this problem of the economical rolling of steel products, which, although it concerns the engineer less than the one just considered, is of the utmost importance to the steel works owner, and cannot, therefore, be overlooked.

It is well known that to obtain the highest economy from any rolling plant, the maximum capacity of such a plant must be realized, for if, say in a plant of 5,000 tons capacity per week, only an average of 3,000 tons is actually obtained, the cost per ton of production on this reduced quantity would be much higher than would have been the case had the maximum output been secured; unfortunately, this condition is all too characteristic of the rolling mills in England.

Causes for Shortage in Output

Let us look at some of the causes which go to explain this shortage in output: First, and probably the greatest, are the constant fluctuations in trade, in sympathy with which the demand rises and falls; and second, the fact that the total capacity of existing plants in this country is now much greater than the average demand for their products, with the result that the total quantity of the work placed is split up into numerous small orders, that rarely ever afford an opportunity for a lengthened run on the same section, by which alone a maximum output is possible. This also results in constant changing of rolls for the different sections required, incurring large expense and a great loss of time.

Limited Output

Under such conditions as these the output capacity of mills cannot possibly be even approximately reached, and the cost of production is thereby chronically excessive, and reacts upon, and checks, demand; and so it would appear that our steelmakers seem to be within a vicious circle, where limited demand results in high cost of production, and where high cost of production again causes limited demand; and this is a situation sufficiently serious to claim the earnest attention of all those directly interested. Not much comfort or satisfaction is to be obtained from those who will tell us that this is clearly a case of the survival of the fittest and the withdrawal of the vanquished from the field.

Remedies have been proposed, to which the author dare not allude in this place, but there is one which is so safely outside the pale of politics that no apology is necessary in referring to it—this is specialization.

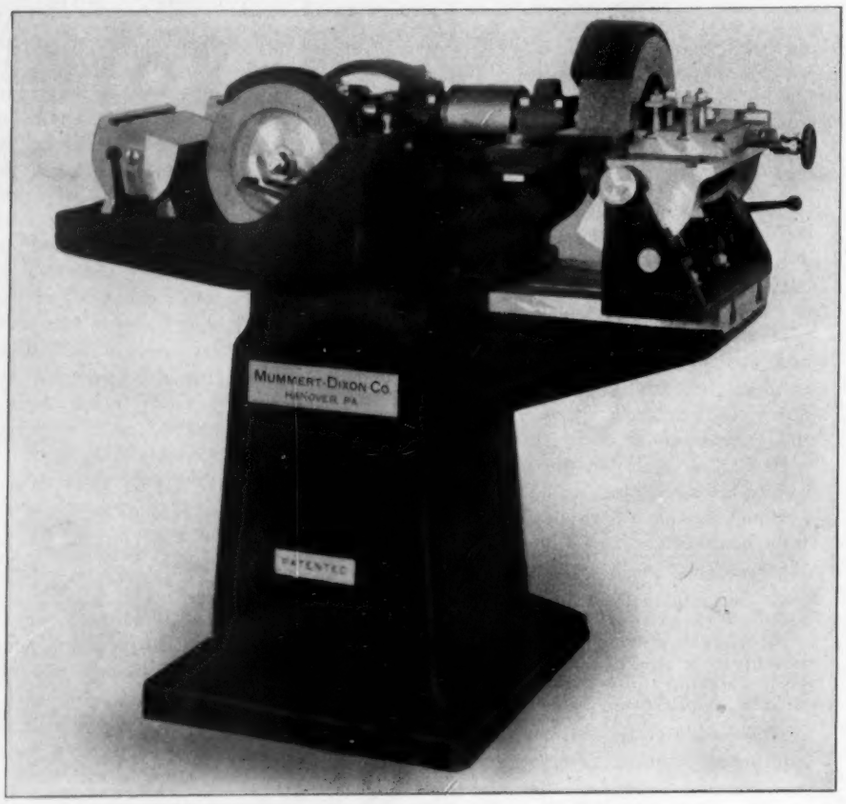
We are all familiar with the saying, "It is a wise farmer who looks over

his neighbor's fence", and those of us who have visited America and Germany and have seen the steel works in these countries, could not fail to have been impressed with the constant endeavor put forth to carry out this principle of specialization to the fullest extent in all their operations; and this for the sole purpose of enabling them to produce cheaply, and consequently to keep their plant running to its fullest capacity, in the knowledge that the more they produce the cheaper they produce.

Hence we see continuous billet rolling mills working all the time on billets alone, and producing these in quantity far above, and at a cost far below, what can be done in this country. The same principle is carried through in all their rolling operations, the orders received at headquarters being carefully classified and sent to the mills specially designed for producing the sections required, and large economies being thereby effected. In Germany, the Stahlwerks Verband, controlling a number of the largest works, carries out this same method, and years of experience have now proved the great value of the system.

At the present time the steel works all over the world are practically full of work, so that the British steelmaker is not seriously affected by American and German competition, but the inevitable ebb in the tide of prosperity is sure to set in, and then the struggle for our share of the business of the world will certainly be keener than we have ever yet experienced. To meet this, our steelmakers will have a very serious and difficult problem to face, as the conditions in this country are admittedly widely different from those in America and Germany.

In whatever way the problem may be dealt with, the value of this system of specialization in design of mills, and classification and selection in the work rolled in these mills, which have proved beyond doubt so beneficial wherever they have been systematically followed, cannot be ignored, and every improvement that can be devised, tending to increase the efficiency and simplicity in operation of such plants, must constantly engage the attention of the engineer, if we are to hold our own against the very formidable opponents who so strenuously assail our position, and who enjoy advantages in regard to our markets here which are unfortunately denied to us by them.



OILSTONE GRINDER BUILT BY THE MUMMERT-DIXON CO.

The Kennicott Co., Chicago Heights, Ill., recently was awarded the John Scott Legacy medal by the Franklin Institute, Philadelphia, on the Kennicott water weigher or measuring device.

An Oilstone Grinder

An oilstone grinder, adapted for tool room use, built by the Mummert-Dixon Co., Hanover, Pa., is shown in the accompanying illustration. On the front arbor are mounted two oilstone wheels, one coarse and one fine. In front of each wheel is a tool rest which can be adjusted easily to any desired angle and is held in position by a locking device. Kerosene, which keeps the stone sharp and prevents glazing, is delivered by a small rotary pump, which conveys the oil from a reservoir in the base. The oilstone wheels are cup-shaped and the oil is directed to the inside of the wheels, penetrating through the pores. When the wheels are once saturated, they require only a small amount of oil. Oil guards are provided to prevent the oil from being thrown off the wheels. At the back of the grinder is mounted a ring emery wheel and at the side the e is a table on which there is a slide for holding work. This slide is provided with micrometer adjustments, while the table can be set at any angle. A rest is provided so that the periphery of the wheel also can be used. When the machine is to be motor-driven, the motor is placed on the base and is belted to the pulley.

"Graphite for the Boiler" is the title of a 16-page booklet issued by the Joseph Dixon Crucible Co., Jersey City, N. J. The use of flake graphite to remove scales that form in boiler tubes is discussed and the method of feeding the graphite into the pump is described. This graphite forms a thin film over the boiler lining, protecting it from the action of acids in the water and associates itself with the sediment, thus preventing the formation of hard scales. As a result, the solid residue precipitated by the evaporation of the water is in such a soft condition that it can be easily ejected by the process of blowing-off.

The Chapman Engineering Co., Mount Vernon, O., recently sold 10 rotary gas producers. Six of the producers are being installed at the open-hearth plant of the Bethlehem Steel Co., South Bethlehem, Pa.; three have been ordered by the Tremont Nail Co., for its open-hearth plant at West Wareham, Mass., and one by the Crucible Steel Co. of America, for its plant at Syracuse, N. Y.

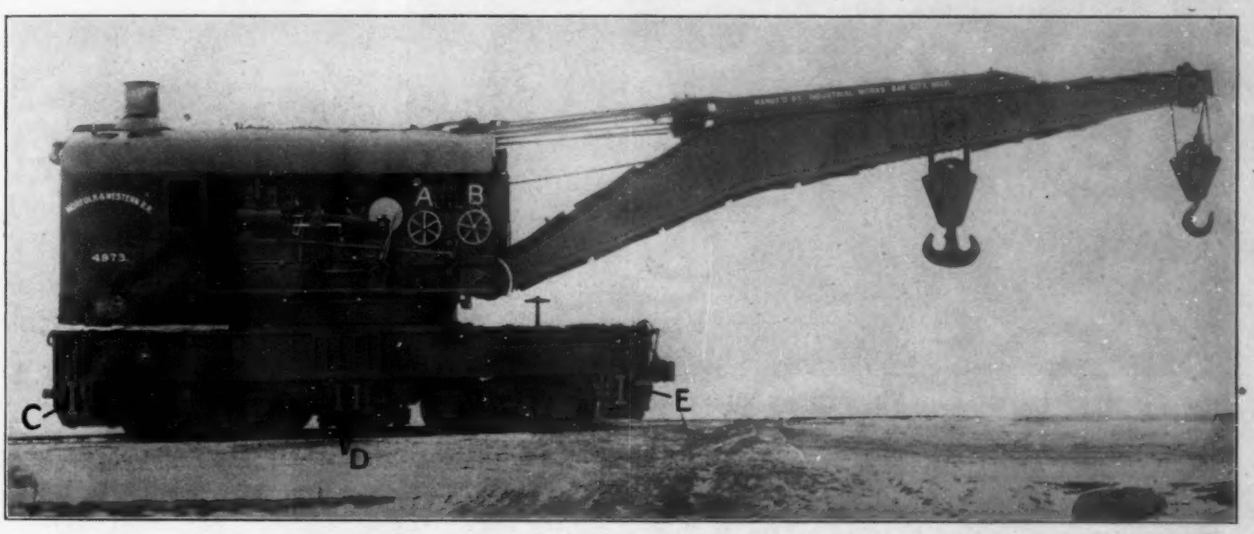
Copper ore imports into the United Kingdom increased from $453,600 in the first two months of 1912 to $1,014,000 in the same period this year.

Powerful Wrecking Crane

The demands upon the railroads for high speeds and maximum hauling capacity have necessitated a decided increase in the weight of equipment. Parallel with this development, the wrecking crane, used primarily to facilitate the erection of bridges and other heavy construction work, but as occasion demands, for the purpose for which its name implies, also has been brought to a high state of efficiency. The Industrial Works, Bay City, Mich., recently completed two powerful wrecking cranes for the Norfolk & Western railroad, which have a capacity of 150 tons each at a 17-foot radius and are powerful enough to lift practically any material required in bridge construction, or any railway equipment which might obstruct traffic, except the heaviest of the largest size locomotives. Each crane is capable of hoisting its maximum load at the rate of 10 to 15 feet per minute, and a noteworthy feature is that the boom may be raised or lowered with the maximum load of 300,000 pounds upon it. The operations of hoisting with either the main or auxiliary block, raising or lowering the boom, and slewing are performed independently, and, with loads up to the capacity of the engines, these movements may be performed simultaneously.

The movements of the main, auxiliary and boom hoists and slewing, are controlled by air-operated clutches, which are actuated by valves and the main and auxiliary hoist brakes which are of the screw type, are operated by the hand wheels shown at *A* and *B* in the accompanying illustration. The framework of the car is 27 feet long and 10 feet wide; it is constructed of steel, with heavy end and longitudinal sills, which are all strongly reinforced and bolted together. Each of these cranes in working condition, weighs approximately 123 tons. This weight is carried on two four-wheel trucks which are equipped with steel wheels with hubs of special weight to suit the large axles. The wheel base is 20 feet. Each truck has complete air brake equipment, and, in addition, a hand brake is connected to one of the trucks. Automatic couplers of standard type are used and the draft rigging attached to both ends of the car are extra heavy. The boiler is designed for 150 pounds pressure and the two cylinders are of ample capacity for the work required.

As the combined weight of the crane and load might be too great a strain on the track, the outriggers, shown at *C*, *D* and *E*, are supplied so that some of the weight may be transferred to the roadbed. The outrigger, *D*, is of telescopic construction and may be extended 7 feet from the side of the car. This outrigger is used when extreme loads are to be lifted, or when a firm foundation cannot be found close to the track. Two of these cranes are now being built by the Industrial Works for the Chicago, Rock Island & Pacific railroad.



WRECKING CRANE OF 150 TONS CAPACITY BUILT BY THE INDUSTRIAL WORKS, BAY CITY, MICH.

"Copper in Steel and Its Influence on Corrosion" is the title of a booklet issued by the American Sheet & Tin Plate Co., Pittsburgh, which contains the paper presented by D. M. Buck at the annual meeting of the American Chemical Society and published in THE IRON TRADE REVIEW, April 24.

Day & Zimmerman, consulting engineers, Philadelphia, have removed from 608 Chestnut street, to 611 Chestnut street, where more commodious quarters have been obtained.

Santa Fe Re-rolling Mill

In order to economically utilize worn-out rails, the Atchison, Topeka & Santa Fe railroad is operating a rail mill at Newton, Kan. All the worn or defective rails which have been replaced on any of the Santa Fe lines are assembled at Newton and an average of 500 rails a day is received. They are slid on skids from the cars to the platform, where they are transferred by a system of greased rollers to any desired point in the shop.

Rails replaced on the main line, which are to be subsequently used for sidetracks, are worked over, straightened, sawed to the required lengths and drilled for new bolts. Such rails as cannot be used for sidetracks are sometimes still good enough to be worked over for bridge guard rails. When they can be put to no better use, the rails are cut up and painted for mile-posts, for which service they are well adapted. The damaged portions which have been sawed off are sold as scrap. Friction saws are used for all cutting operations.

At the present time, about 100 frogs a month are also being turned out and all the frog clamps used on the Santa Fe system now come from the Newton shop. The work of making and repairing frogs and clamps effects a big saving in the course of a year, and so creditable has been the showing in this direction that the work of the plant is to be extended so that all the switch points and switch guard rails used on the entire system will shortly be the product of the Newton rail mill. To this end considerable new machinery has been purchased, which will be housed in a commodious new building now being erected.

Use of Turntable in Post Drilling Operations

How This Equipment Effects Economies in Machining Castings in Which Many Holes Are to be Sunk

For drilling operations on heavy or bulky castings where there is considerable surface to cover and a large number of holes to be sunk, the horizontal post drill offers many advantages, and in large shops these tools are useful as auxiliaries to the regular radial drill equipment.

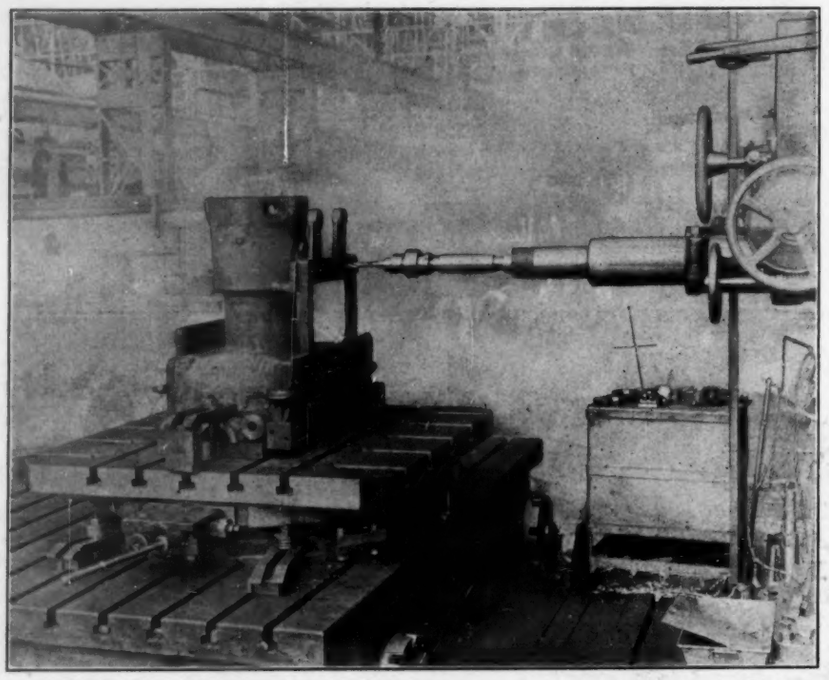


FIG. 1—GAS ENGINE CYLINDER JIGGED ON TURNTABLE FOR POST DRILLING OPERATIONS

Where a great many holes are to be drilled in a flat plate, as in Fig. 4, the horizontal post drill often results in saving half the time consumed by ordinary methods. The machine is not only useful for drilling, but is adapted to a wide variety of boring and facing operations, as indicated in Figs. 5 and 6. It also may be employed for reaming, tapping, face milling, etc.

Recently, the Pawling & Harnischfeger Co., Milwaukee, a large manufacturer of horizontal post drills, perfected a turntable, Figs. 1 and 2, for use in connection with its machine which makes it possible to drill any point on the four sides of a piece at one setting. This greatly increases the capacity and flexibility of the tool.

The Pawling & Harnischfeger post drill, which is motor-driven, consists essentially of a post or column carrying a sliding head to which the horizontal drilling spindle is fixed. The work is mounted on a four-wheel truck operating on a track laid in front of the machine. The drill covers a working surface of 60 square feet and will drill or tap holes up to 3 inches in diameter. The speed control is effected by a variable speed motor operating in connection with four mechanical speed changes. The motor controller provides for 20 speed changes, so that a total of 80 spindle speeds are obtainable, graduated evenly between 10 and 528 revolutions per minute. There are eight feeds for each spindle speed ranging from 0.008 inch to 0.148 inch per revolution of the spindle. The motor is located on the top of the column and drives a vertical shaft through a pair of bevel gears. From the latter the motion is transmitted by worm gears to a horizontal shaft connected with the drilling spindle.

The Turntable

The turntable which has recently been developed, is designed as a separate unit and may be clamped to the regular working table of the machine or removed as desired. It consists essentially of an upper slotted rotating part carried on a cast iron foundation ring as illustrated in Figs. 1 and 2. The rotating part is guided by a steel center pin secured to the base plate and is supported by 90 conical steel rollers, each 1 5/16 inches in diameter and 2 inches long.

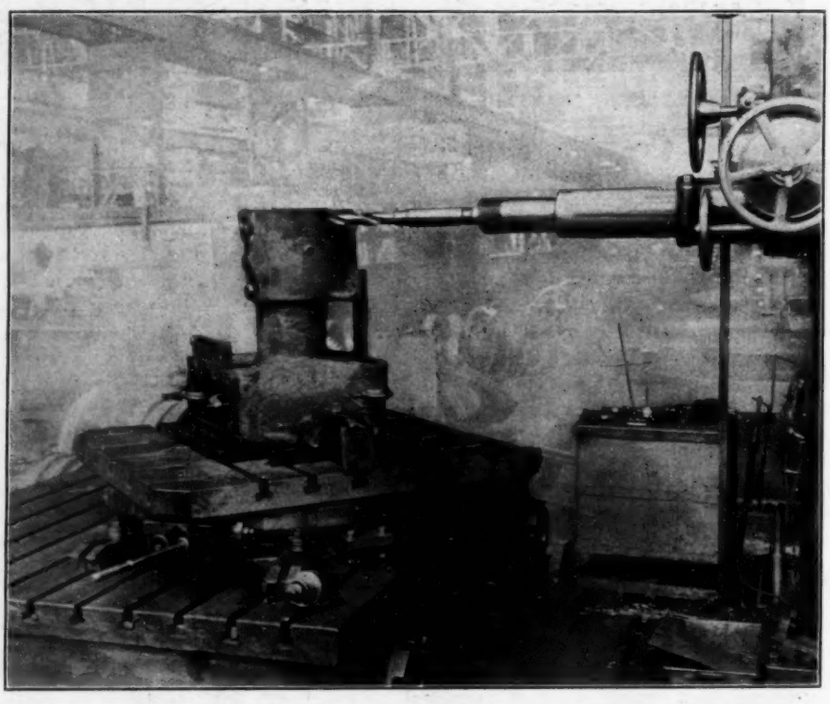


FIG. 2—TURNTABLE ROTATED 45 DEGREES TO REACH HOLE ON ANOTHER SURFACE

The rollers operate in a circular raceway and are thoroughly protected against dust and chips. Three clamping blocks which engage a circular rim prevent the turntable from tipping or turning while drilling. An additional circular rim with notches is bolted to the under side of the square part of the table. The notches engage with a steel locking pin, so that the table can be set at any desired angle, the rim being graduated into 360 degrees. When the locking pin is thrown back it is held automatically by a spring catch which leaves both of the operator's hands free to turn the table. The clamping blocks are designed so that no undue pressure can be exerted on the conical rollers while locking the table in position. The center pin, around which the table rotates, is countersunk even with the bottom of

FIG. 3 — BORING AND DRILLING A LARGE WHEEL

the tee slots; this permits the insertion of a plug to accurately center work on the turntable.

The advantages of the turntable are especially apparent in handling gas engine cylinder work such as that illustrated in Figs. 1 and 2. On a job of this type there are from 48 to 60 holes to be drilled on the four sides of the cylinder. Heretofore it has been necessary to make an expensive box jig in which the whole casting could be placed and the jig had to be turned over and reset to reach each of the four surfaces with the drilling apparatus. With a post drill and the Pawling & Harnischfeger turntable attachment, inexpensive plate jigs may be utilized. Fig. 1 shows the drill cutting the

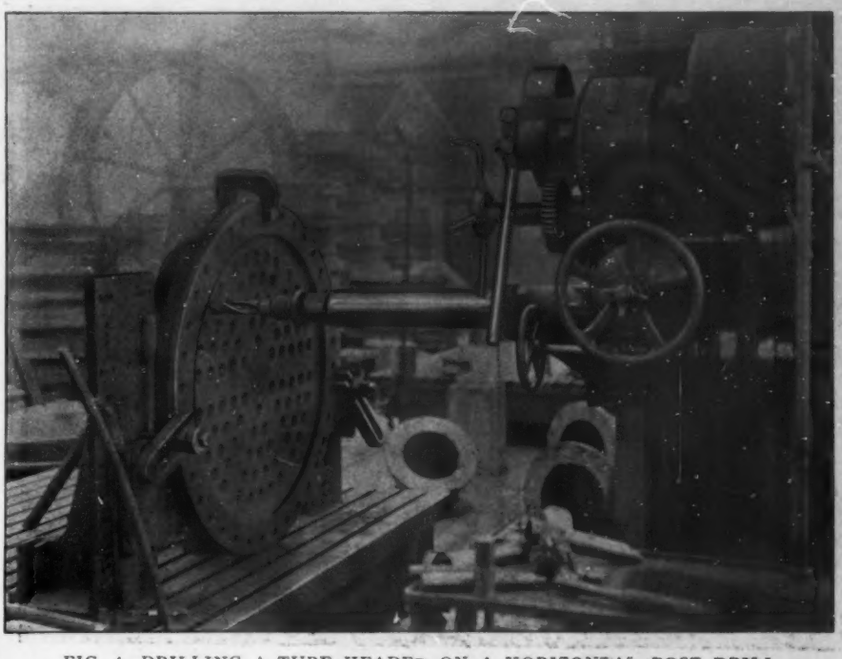


FIG. 4—DRILLING A TUBE HEADER ON A HORIZONTAL POST DRILL

holes for the valve mechanism on a tractor engine cylinder. The cylinder is clamped to the platform of the turntable and the jigs are fastened with small hand clamps. When all of the holes in the first surface are finished, the turntable is rotated through 45 degrees, permitting the drill to reach a hole near the top of the cylinder, as illustrated in Fig. 2, after which the smaller plate jig on the back of the casting is brought into position. The turntable is said to save 30 per cent of the time previously required for this operation.

The facility with which a large number of holes scattered over an extensive surface may be bored with the aid of a post drill is illustrated in Fig. 4. This shows a tube header containing 120 holes being drilled at the shops of the Allis-Chalmers Mfg. Co., Milwaukee. The casting is mounted vertically on the tee-slotted platform of the truck and the jig, which is made in the form of a face plate, is hand-clamped to the work and also to upright cast iron supports bolted to the table. The work may be set up in a few minutes and the entire number of holes drilled and reamed without loss of time. For a job of

FIG. 5—BORING A HEAVY STEEL CASTING

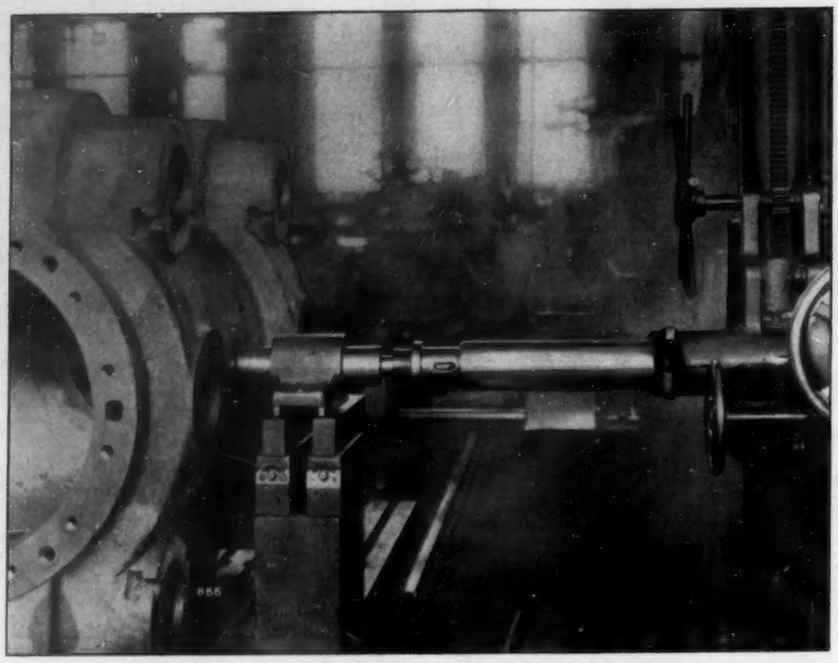


FIG. 6—BORING AND FACING HOLES IN GAS ENGINE CYLINDERS

this kind the turntable is unnecessary.

Fig. 3 illustrates a job which ordinarily would be handled on a large boring mill or under a heavy radial drill. The work to be done consists of boring the hub and drilling a number of bolt holes in the hub flange of the large tractor wheel. The rim of the wheel is clamped to the platform of the truck and the side thrust of the drill is counteracted by two adjustable braces which are wedged against the spokes near the hub of the wheel. Each brace consists of a section of ¾-inch iron pipe fitted with a nut on top into which an adjustable push rod is screwed.

Figs. 5 and 6 show the post drill arranged for boring operations. In Fig. 5 there are two holes, each about 4 inches in diameter to be bored in a steel casting. The boring bar is of the usual type and in this case it is supported by an outboard bearing to prevent chattering. No jigs are used for this job, the casting being simply clamped to the table by two center bolts, as shown.

Fig. 6 shows the post drill boring water jacket and valve chamber holes in a large gas engine cylinder. The boring bar rotates in a sleeve bearing supported on blocks set as close to the cutting tool as possible. The blocks may be adjusted laterally by means of lead screws to assure the correct alignment of the boring bar.

The post drill is useful in steam as well as gas engine cylinder work. At the West Milwaukee shops of the Chicago, Milwaukee & St. Paul railway, horizontal drilling and boring machines have been substituted exclusively for vertical, radial extension arm drills for drilling and boring locomotive cylinders. A locomotive cylinder is set with a planed surface in contact with the table of the machine and all the holes for the valve chamber, cylinder and by-pass valve heads are drilled without resetting. All the setting necessary to bring the drill in line with the hole is accomplished by moving the table or the head of the machine. The work sets directly in front of the operator in a vertical position and it is not necessary to do any climbing to get at the job.

When the cylinder is set for the drilling operations, the by-pass valve chamber is also bored and faced and the joints for steam pipe and vacuum valve rings are faced. A total of 161 holes is drilled in each cylinder, of which 81 are tapped and 32 are faced. The total time required for this work is 10 hours. The holes range from 25/32 inch to 2⅛ inches in diameter and the tapped holes are from ⅞ to 1⅛ inches. One hour is required for facing the steam pipe and vacuum valve ring joints. The by-pass valve chamber is bored and faced in six hours. Thus, the total time required for all the work done on the cylinder with the Pawling & Harnischfeger horizontal post drill is 17 hours.

The Merrill Iron Works, Merrill, Wis., is completing improvements begun Dec. 1. The company has discontinued its automobile department, and has devoted the space to its general shops. The salesrooms have been rearranged and only company products are shown. The machine shop has been enlarged and all buildings overhauled. The improvements increase the capacity considerably and the concern henceforth will devote its entire time to the manufacture and marketing of its own products.

A machine for testing stay bolts has been perfected by the Altoona Machine Co., Harrisburg, Pa. It is claimed that this machine subjects a bolt to every strain it would undergo in a boiler.

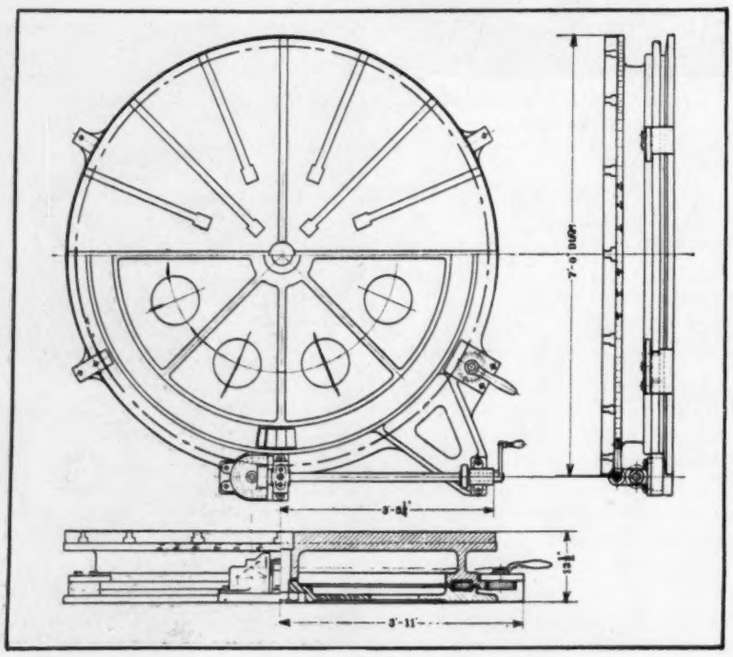


FIG. 7—DETAILS OF A 7-FOOT TURNTABLE

Iron and Steel Institute Discusses Sound Steel

Report of the Proceedings of the Annual Spring Meeting of This Organization at London—Bessemer and Carnegie Medal Awards

By J Horton, Staff Correspondent

At the annual spring meeting of the Iron and Steel Institute, held at the Institution of Mechanical Engineers, London, Eng., May 1 and 2, interest was centered largely in the discussion of methods of producing sound steel ingots. A feature of the proceedings was the presentation of the Bessemer medal to Adolphe Greiner, director general of the John Cockerill plant at Seraing, Belgium.

The discussion of methods of producing sound steel ingots was precipitated by a paper presented by Benjamin Talbot, entitled "The Production of Sound Steel by the Lateral Compression of the Ingot While Its Center is Liquid". In opening the discussion, Sir Robert Hadfield pointed out that fluid steel varies in temperature from 40 to 50 degrees and he believed that this has a considerable influence on its quality in the finished form. Referring to Mr. Talbot's paper, he called attention to the fact that steel containing not more than 0.03 per cent of phosphorus was treated by this process and he believed it would be interesting to learn the effects of the employment of steel containing 0.06 per cent phosphorus. Sir Robert Hadfield favored the method of feeding the ingots from the top, being convinced that thereby segregation could be eliminated entirely.

Experiments at Cockerill Works

H. Savage, of the Cockerill works, stated that an effort was made to adapt the Hadfield process to their practice, ordinary cast iron ingot molds being used. However, it was found to be impossible to keep the metal liquid by the use of charcoal at the top of the ingot, as the steel solidified within 20 to 25 minutes after casting. The pipe attained about the usual dimensions and the slag was spread over the surface of the liquid steel, actually being drawn into the cavity, thereby bringing about a worse condition than existed before this special process was tried. To obtain the full benefit of this top-heating method, it was found that the ingot head must remain liquid until the body had completely solidified and as a result of experiments it was found that an ingot 18 inches square would have to be heated in this way for at least one hour. As a result of the loss of heat, a soaking pit of the ordinary type would be useless and it would have to be replaced by pits especially heated. Furthermore, it was found that the casting floor of the plant would have to be greatly enlarged to provide space for ingots from five or six heats treated by this process.

Core of Soft Steel

Referring to Mr. Talbot's statement that finished rails made by his process contained a central core of soft steel around which the segregated metal was distributed in a layer of uniform thickness, it was found that the claim of reduced brittleness resulting from this form of segregation was not borne out by certain experiments made in the rail mill at Seraing. Tests were made of steel produced by this process and central sections of blooms, 8 inches square, were rolled from ingots, 20½ inches square, which were left in the soaking pit 30 minutes. One of these was immediately rolled to its final dimensions and sections of this rail displayed in a marked degree the segregation of ingots prematurely bloomed. The second bloom, after a few passes through the rolls, was reduced in section to 16 inches square. This was returned to the soaking pit for one hour and later was rolled to its final section. In this case, Mr. Savage said that while the segregation was considerably reduced, nevertheless it still existed. This, he believed, represented Mr. Talbot's practice. Although it is true that the pipe in the ingot is eliminated, while in ordinary practice an insufficiently cropped ingot might give one or perhaps two rails out of six or seven in which the effect of pipe might be perceptible, nevertheless by the Talbot process the peculiar segregation previously referred to existed in almost every rail. These experiments were made on four different casts of steel containing approximately 0.45 per cent carbon. One ingot from each cast was rolled according to Mr. Talbot's specifications, another was rolled before complete solidification without being returned to the soaking pit, while the third ingot was allowed to solidify and then was bloomed in accordance with the usual practice. These ingots were rolled into rails without any appreciable cropping and for the purpose of making tests, sections were taken from the ends of the rails corresponding to the tops of the ingots. Drop tests made of these rails showed varying results from those rolled in accordance with the Talbot method. The rails rolled from the second ingot showed better resisting qualities while rails obtained from the ingots tested in the usual manner, with one exception, gave very good results.

A. G. Scott, of the Monk Ridge Iron Works, Leeds, Eng., stated that his experience was confined chiefly to the manufacture of rolls, although for some time he had been engaged in the compression of steel by the Harmet process. He noted that ingots compressed quickly into rolls seemed to contain sulphide in a different form than existed in ingots compressed slowly and continuously by the Harmet process. By this method of casting, the ingot is constantly kept filled with molten steel to its top and no pipe is formed.

Test of High Carbon Steel

F. W. Harbord stated that he had been furnished with sections of steel made by the Talbot process, some of which were deoxidized with aluminum, while other sections were not treated in this way. Steel containing 0.71 per cent of carbon was bent at an angle of 51 degrees without fracture and this, he believed, was a fair test for high carbon steel. On the other hand, the segregation was clearly defined. The carbon in the center was 0.56 per cent, but on the line of segregation, 0.75 per cent. The sulphur also segregated considerably, the maximum in the center being 0.075 per cent, while on the outside it was 0.054 per cent. He compared the material to case-hardened steel with a hard surface on the outside and a soft inside core. He stated that the size of the ingots seems to suggest that the process should not be carried out in 25 minutes and if the metal was treated prematurely or too late, it would be

squeezed too near the surface and the pipe would not be closed. However, if these difficulties could be overcome, a serious problem would be solved.

The Compression Process

J. M. Gledhill said that at various times he tried the application of pressure to ingots of large dimensions. Ingots weighing from 25 to 30 tons had been treated in this way and he was of the opinion that Mr. Talbot was working along the right lines, although he appreciated that there were many practical difficulties to be overcome. The bleeding of the steel, he said, would be liable to result in local cavities distributed indiscriminately throughout the ingot. The question of casting temperature, he believed, was one of great importance. By the Talbot compression process, a good surface is obtained and this extends into the interior of the steel section. He ventured the opinion that the compression process has come to stay and added that any method that could control segregation and at the same time would produce a better surface on the finished article, in addition to being economical, must be of great advantage to all those engaged in the production of steel ingots.

Replying to the discussion, Benjamin Talbot said that pouring the liquid steel from the nozzle of the ladle gave unsatisfactory results. Referring to the experiments at Seraing, he was of the opinion that this Belgium firm had not adhered to his process closely. With reference to the size of the ingot that could be treated, he stated that size was of no importance, although uniform conditions must prevail to obtain satisfactory results.

Electrically-Driven Reversing Mill

A new type of electrically-driven, two-high continuous reversing mill was described by Andrew Lamberton. The time of reversal of this mill was placed at from three to five seconds and this period was criticized as being impractical for a finishing mill. It was stated that many of the mills in Great Britain could be reversed in a second or less. Mr. Lamberton, in reply, added that it was extremely doubtful whether any of the mills in England could be reversed in three seconds. The mill he described was designed to roll 40 or 50 tons of steel per hour, with a weekly output of about 5,000 tons.

"The Economy of the Dry Blast" was the subject of a paper presented by Prof. J. von Ehrenwerth. A. J. Reese, formerly affiliated with the Maryland Steel Co., Sparrows Point, Md., confirmed most of the author's results. He stated that it was well-known that blast furnaces had a maximum permissible blast temperature beyond which the furnace would not operate smoothly and regularly. This maximum, it was found, varies with the design of the furnace and the material used. He was of the opinion that this variation was due to the difference in the moisture rather than that of the temperature. As a result, the location of the melting zone would vary, but by the introduction of dry air the melting zone would remain stationary. Continuing, Mr. Reese said that in the United States the proportion of moisture in the air was high, sometimes amounting to 11 grains per cubic foot, or approximately 6½ per cent, but by employing the dry blast apparatus the moisture was reduced to approximately 1½ per cent. The improvement effected is not in proportion to the actual amount of moisture removed, but is due in a great measure to the more regular operation of the blast furnace. Plants employing dry blast apparatus have effected economies in coke consumption varying from 3 to 8 per cent.

Papers Presented

Among the papers presented at the meeting are the following: "The Influence of the Presence of Sulphur Upon the Stability of Iron Carbide in the Presence of Silicon", by W. H. Hatfield; "The Influence of Metalloids on the Properties of Cast Iron", by H. G. Cole; "The Influence of Silicon on the Corrosion of Cast Iron", by Dr. J. W. N. Friend and C. W. Marshall; "Rolling Mill Practice in the United States", by Dr. J. Puppe; "Some Fundamental Faults of Present Day Furnaces and Their Remedies", by Allyne Reynolds; "Tenacity, Deformation and Fracture of Soft Steel at High Temperatures", by Walter Rosenheim and J. C. W. Humphrey; "Critical Ranges of Pure Iron", by Dr. H. C. H. Carpenter, and "Studies in the Flow of Cold Steel", by Percy Longmuir.

Adolphe Greiner, who was awarded the Bessemer medal, was educated at the Liege School of Mines and in 1864 he was appointed chemical engineer of the steel works laboratory of John Cockerill, Seraing, Belgium, later becoming head of this department. In 1887, he was appointed general director of the company and under his regime the firm adopted the basic Bessemer process. This plant is also the pioneer in the utilization of blast furnace and coke oven gases in the generation of power in iron and steel plants. The award of the Bessemer medal was made to Mr. Greiner in recognition of his many services to scientific metallurgy and of his valuable contributions to the theory and practice of gas engine design and construction.

Carnegie Gold Medal

Dr. Newton Friend was awarded the Carnegie gold medal in recognition of his investigations into the corrosion of iron and steel. In 1908, he was awarded $500 and since has received two further amounts to enable him to carry on his experiments. Dr. Friend is now head master of the Victoria Institute, Worcester, Eng. Carnegie scholarships were awarded as follows: J. F. Apfelstiedt, Dresden, Germany, for a research into the study of the means of transportation in relation to the cost of production; L. B. Muller, Paris, for researches on the nature of gases contained in liquid steel with special reference to basic steels; Niel Brodie, Newcastle-on-Tyne, Eng., for research into the formation of titanium in titaniferous ore; A. Hirsch, New York City, to carry out an investigation on the electric furnace; William Hamilton Patherson, Birkenhead, Eng., for investigation on the constitution of combustion of fuels, and to H. Rudeloff, for a proposed investigation on the influence of the method of riveting upon the stresses in rivets and upon the tensile properties of riveted material.

The annual dinner, which as usual was a brilliant function, was held in the Grand Hall of the Hotel Cecil and was attended by members and guests from the United States, France, Germany, Belgium, Spain, Canada and Australia.

New Building for the Venango Mfg. Co.

The Venango Mfg. Co., maker of railway supplies, Franklin, Pa., is adding a two-story brick building, 40 x 140 feet, to its plant. The new building will be used as a pattern shop and warehouse.

Individual motors are to be installed over the entire plant to replace large motors and shafting as soon as the motor-generator arrives to transform the Oil City alternating current to direct. Sixteen motors of various sizes, aggregating over 200 horsepower are ready to install. This is expected to be economical, as any individual machine may be operated independently by the turn of a switch. The present electric power station will be on the market shortly.

FOREIGN MARKETS

BELGIAN IRON TRADE

Brussels, May 8.—Now that the general strike is over, iron masters are setting to work to get their order sheets refilled. This process has brought about further modifications of prices both for the domestic and export market. Export prices, which are most affected, may now be quoted as follows: Iron and steel bars, £5 10s 6d to £5 11s ($26.89-$27.02); girders, £5 15s ($27.99); rods, £5 18s ($28.72); rails, £6 to £6 1s ($29.21-$29.45½); plates of ¼ inch and more, £6 5s ($30.43); sheets, ⅛ inch, £6 6s ($30.67).

GERMAN IRON TRADE

Berlin, May 8.—The government trade statistics for the past quarter have been recently issued, and also the monthly trade report by the steel syndicate. The latter is loth to admit any relaxation in previous favorable conditions. It says that the sale of half-products for delivery in the second quarter has been fully equal to previous periods, and that specifications are satisfactory. Business in tram rails is very good, with engagements overlapping into next year. Shapes are unfavorably affected by the continued depression in the building trade.

The report from the Rhine Westphalia iron market observes that the political situation is making itself more and more felt in respect to new orders, but old orders will keep the factories going for several months. It is seen, however, that for the autumn and winter, unless the improvement in the political situation sets in immediately, prices must give way. The crude iron market is still strong and the producers have difficulty in supplying the demand. The half products market is a good one, and consumers have protected themselves up to July 1; and since the new large works in Lorraine are at work, the requirements for the rolling mills can be supplied with greater ease than before. Girders and section iron are in good request, but there is considerable hesitation on the part of buyers owing to the scarcity of money and the unsatisfactory state of the building trade. An improvement in this direction is not immediately looked for. Prices inland are unchanged; but export goods are a trifle cheaper. Bar iron manufacturers are busy, but some sacrifice has to be made in this to obtain fresh orders; 144 marks ($33.84) ex Oberhauser, is the price at which business has been done. This makes something like 11 marks ($2.58½) less than the highest price reached; but this is considered exceptional. The general price is for cast bar iron between 115 marks and 120 marks ($27.02½ and $28.20). Export business has become much more difficult for these goods, and prices have had to give way—following the example of the Belgians. The band iron manufacturers are holding on to the price of 145 marks ($34.07½), net cash Oberhausen; but they are not getting fresh business. Competition is marking the goods down by 5 marks to 7.50 marks ($1.17½ to $3.52½) per ton without much success. It is Belgian competition more than anything that is weakening this market. However, the works are busy, but not uniformly so. The competition of outsiders is very keenly felt. The plate market continues good, but the note for new business is "difficult"; and this is not to be had now at the high prices recently ruling. Coarse plates are quoted 130 marks ($30.55). Similar observations apply to the fine plate market, although the works are very busy with them. Orders for future delivery can only be had at lower prices; these are quoted 140 to 145 marks ($32.90 to $34.07½). Some orders, it is said, have been taken at 135 marks ($31.72½). Export business is difficult and prices must give way in face of foreign competition. The pipe market has been good for some time. Here again future orders are scarce.

RUSSIAN IRON TRADE

St. Petersburg, May 7.—The production of manganese ore in the Nikopol district in 1912 amounted to 14,700,000 poods, compared with 12,300,000 poods in the preceding year (529,200,000 and 442,800,000 pounds). Practically all of it was placed with the local iron works.

According to a statement of the Congress of Industrialists of South Russia, the quantity of iron ore produced in the famous Krivoirog iron ore basin in 1912 was 326,300,000 poods (11,746,800,000 pounds), or 38,700,000 poods (1,393,200,000 pounds) more than in 1911. As 342,800,000 poods (12,340,800,000 pounds) were sold it is obvious considerable reserves were drawn on from the preceding years; 37,300,000 poods (1,342,800,000 pounds) were exported and 305,500,000 poods (10,998,000,000 pounds) were used at the local iron works. There was a considerable reduction in the export compared with 1911, all which was to be expected as Russia is suffering still from a scarcity of pig iron.

FRENCH IRON TRADE

Paris, May 8.—The industrial market in France has become very quiet and new business is exceedingly scarce. Here, as elsewhere, the ironmasters are waiting for the definite conclusion of peace in order to see the national industry resume the activity of some time ago. The works are now existing practically on old orders and if new ones are not booked the closing down of many works is within three months reach. French industry is waiting on diplomacy.

Contract for Plant in New South Wales

The Broken Hill Proprietary Co., Ltd., which will build a new steel works and rail and structural mill at New Castle, New South Wales, has awarded a contract to the W. B. Pollock Co., Youngstown, O., for a 500-ton blast furnace. A contract for the blowing engine has been placed with the Mesta Machine Co., Pittsburgh, and Mackintosh, Hemphill & Co. have been given the contract for a blooming mill. It is probable that contracts for three open-hearth steel furnaces, mill buildings, etc., will be placed within the next month or 60 days.

Bids have been asked on the following cranes: One 150-ton ingot stripper; five soaking pit cranes; one 100-ton ladle crane; one 60-ton ladle crane; charging machine; one 60-ton, one 25-ton and one five-ton standard crane and three electric spout cranes for the open-hearth department.

As announced in the Feb. 20 issue of THE IRON TRADE REVIEW, James B. Ladd, 1412 Mutual Life Insurance building, Philadelphia, is the engineer in charge.

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Investigations—Before and After Taking the Tariff Dose

For years, in connection with tariff agitation, there has been a demand for scientific and thorough investigation of manufacturing concerns to determine the cost of manufacturing in order to enable congress to decide what, if any, protection should be granted to the industries investigated. Although strongly supported, the tariff commission idea was also vigorously opposed. Not until President Taft appointed his tariff board, with possibly the exception of the commission which served in the days of President Arthur, was anything like a fair trial given to determine what results could be obtained by an investigation. The Taft board did some excellent work, but its career was cut short because the party which came into power was opposed to a board controlled by the president and was pledged to enact a tariff measure as quickly as possible.

Congress having determined not to have a thorough investigation before passing a tariff act, the question now arises whether an investigation should follow the passing of the Underwood bill. Chairman Underwood has served notice that if any manufacturers endeavor "to grind labor in the interest of Republican politics, a bureau of the government will ascertain the reason why". This utterance was in the course of a debate in the closing hours of the consideration of the bill by the house, and in his calmer moments, probably Mr. Underwood would not claim or insinuate that the manufacturers would deliberately grind labor for the benefit of any party. It is, however, entirely within the bounds of probability that, in the readjustment which will become necessary in the event of the passage of the Underwood bill by the senate, exact justice may not be done to all working men. Anything that promises to soften the harshness of the readjustment should be welcomed. Secretary Redfield says that wages should not be reduced except under the direct necessity, and nobody will be disposed to dispute that assertion. There will also be general agreement with Mr. Redfield's declaration that operating with bad equipment, with unscientific treatment of material, with antiquated methods in poor locations, with insufficient capital and generally uneffective management will not be esteemed a satisfactory reason for reducing wages. In a recent speech before the National Association of Employing Lithographers, Secretary Redfield assured his hearers that the government's investigation would not be carried on in a "trust-busting" spirit, but with the idea of aiding any industry that had dropped into a rut. He said that the department of commerce exists for promoting American industry and commerce at home and abroad and intends to do its work as well as it can.

These are the words of a successful manufacturer and are worthy of some consideration. Investigation of the pottery industry has already been inaugurated and the country will watch with keen interest the methods employed in this investigation and will carefully note the results. Mr. Underwood has declared that if mistakes have been made in framing the tariff bill, he will frankly admit them, if convinced by the results of investigation. In some cases, these investigations may have somewhat the character of a *post mortem* examination, but if honestly and thoroughly made, the ultimate results will be good, and the government investigators are entitled to the cooperation of manufacturers who are anxious to have the exact facts made known.

The Steel Corporation's "Unfilled Orders"

The United States Steel Corporation's monthly report of unfilled orders on hand have this year been disclosing nothing with which the steel trade was not already fairly familiar. The reports have merely put into definite figures what the trade has already known. Month by month this year, the Corporation has reported a decreased total of unfilled tonnage, January showing a decrease of 105,000 tons, February 170,000 tons, March 188,000 tons and April 490,000 tons, making 463,000 tons for three months and then 490,000 tons for the one month of April.

Sight must not be lost of the fact that the Steel Corporation's report is not of orders actually specified, but of all definite orders or contracts, whether specified or not. For several months, probably since last October, specifications have been coming in at a greater rate than new business, whereby the unspecified tonnage of contract obligations has been decreasing while, until very lately, the total of specifications on books has been increasing, or has at least been stationary.

The great buying movement which began in November, 1911, and proceeded with scarcely a halt for a twelvemonth, culminated last October, for which month the Corporation reported an increase of no less than 1,042,874 tons in unfilled tonnage. The

trade has well understood that such a movement could not continue indefinitely. In some periods, tonnage piles up on the steel mills, and there must be intermediate periods in which the accumulations decrease. Market reports since the first of the year have indicated that strictly new buying was at a reduced pace, and for several weeks past further decreases in new buying have been reported. The April loss reported in unfilled tonnage is but the numerical expression of the market condition as it has been reported.

The gains in unfilled tonnage had been so great that the decreases in the past four months have set back the Corporation by only a relatively small margin. It must be recalled that, even in 1911, when the market was dull and declining, the Corporation's unfilled tonnage showed a net increase, and in 1912 there was a very large increase. The recent losses retrace but a very small part of the advance made in those two years. This is well illustrated by the following presentation, showing the Corporation's tonnage at selected dates, first on Dec. 31, 1910, when it was at the smallest ever reported, then at the beginning and end of last October, during which month there was a point at which the unfilled orders were the same as those reported for the close of the last month, and finally at the high point on the bulge and at the present time:

Dec. 31, 1910	2,674,757
Sept. 30, 1912	6,551,507
Oct. 31, 1912	7,594,381
Dec. 31, 1912	7,932,164
April 30, 1913	6,978,762

Thus the Corporation now has on its books a larger tonnage than it had at the beginning of last October. Its specifications, the tonnage of material which can be shipped without further negotiation or action on the part of the buyer, is well understood to be much larger than at that time.

Very Interesting Pig Iron Statistics

The final pig iron statistics for 1912, as presented by the Bureau of Statistics of the American Iron and Steel Institute, are made unusually interesting by the inclusion of information not hitherto secured. In the first place, a statement is made as to the condition of the pig iron for use, whether molten, chill cast, sand cast, etc., and in the second place there is given a statement of the quantity of the different descriptions of fuel used in its manufacture. There is the usual complete segregation as to grade, also the familiar statement of the quantity of limestone consumed.

A distinction is made between machine cast and chill cast, there being 6,214,121 tons of the former and 6,726,017 tons of the latter, the distinction being merely in method, the results being 6,940,138 tons of pig iron cast in chills. The sand cast iron amounted to 6,309,495 tons, while the total production of pig iron outside of Bessemer and basic amounted to 6,645,036 tons, from which it may be concluded that nearly all the foundry iron produced was sand cast and only a small part of the Bessemer, Bessemer iron being generally used in molten form.

The total amount of iron used in molten condition was 16,466,722 tons, which probably represented nearly 11,000,000 tons of the total 11,664,015 tons of the Bessemer and low phosphorus iron, together with say 6,000,000 tons of the 11,417,886 tons of basic iron produced, the remainder of the basic being chill cast.

It is interesting to compare the production of pig iron by grades in 1902 and 1912, to show the variation. The following table gives the percentage which each grade constituted of the total, in 1902 and 1912:

	1902		1912	
	Gross tons.	Per cent.	Gross tons.	Per cent.
Bessemer and low phos.	10,393,168	58.3	11,664,015	39.2
Basic (mineral fuel)	2,038,590	11.4	11,417,886	38.5
Malleable	311,458	1.7	825,643	2.8
Fdry. and high silicon	3,851,276	21.6	5,073,873	17.1
Forge	833,093	4.7	469,183	1.6
Spiegeleisen	168,408	0.9	96,346	0.3
Ferro-manganese	44,573	0.3	125,378	0.4
White, mottled, etc.	172,085	1.0	44,031	0.1
Direct castings	8,656	0.0	10,582	0.0
Totals	17,821,307	100.0	29,726,937	100.0

The great relative decrease has been in Bessemer iron, for while the tonnage of this grade increased slightly in 10 years, the total of all pig iron increased 53 per cent. The maximum production of Bessemer and low phosphorus iron was in 1906, 13,840,518 tons.

In 10 years the proportion of basic iron has more than tripled. Excluding low phosphorus iron, the production of Bessemer and basic was substantially identical in 1912. Foundry iron has decreased relatively, though not absolutely. The maximum production of foundry iron was in 1909, 5,322,415 tons, there being a decrease to 1912 of 5 per cent, while in the same time total production of pig iron increased 15 per cent.

The statement of fuel consumption in the statistics now presented is very interesting. In making the bituminous coal and coke iron, there was consumed an average per ton of 2,436.5 pounds of material, this being practically coke, as the amount of raw bituminous coal was trifling. In making mixed anthracite and coke iron, there was consumed an average of 565.2 pounds of anthracite and 2,341.6 pounds of coke, while in making straight anthracite iron there was consumed an average of 2,954.7 pounds and in making the charcoal iron there was consumed an average of 102.1 bushels of charcoal per ton.

Interest naturally centers upon the question if the smeltability of our ores is varying from year to year. Some light can be thrown upon this question by studying the consumption of limestone in making pig iron. In THE IRON TRADE REVIEW of Aug. 18, 1910, this comparison was made for the years 1897 to 1909, inclusive, 1897 having been the first year for which the limestone figures were given. The comparison showed a sharp increase from 1897 to 1900, which was attributed to the mining only of the richest ores of the Lake Superior region in 1897 and 1898, whereas demand required the mining of leaner ores in the next two years. Since 1900 the quantity of limestone has not increased. It is known that the average iron content of Lake Superior ores has gone down from the average of 1900 to the present time, but on the other hand the proportion of Lake Superior to total ore used in the United States has increased and these influences apparently have tended to balance. The full table of limestone consumption per ton of pig iron, in pounds, is given below, from the first statistics to date:

1897	1,002.3	1901	1,202.7	1905	1,144.1	1909	1,190.5
1898	1,020.4	1902	1,207.7	1906	1,192.8	1910	1,191.8
1899	1,113.7	1903	1,207.3	1907	1,247.8	1911	1,144.8
1900	1,222.9	1904	1,128.0	1908	1,229.4	1912	1,137.2

NEW FEATURES

In Statistical Report on Pig Iron Production.

The Bureau of Statistics of the American Iron and Steel Institute has received from the manufacturers complete statistics of the production of all kinds of pig iron by grades in the United States in 1912. For 1911 and previous years the statistics given below were compiled by the American Iron and Steel Association. The grand total for pig iron for 1912 differs slightly from the preliminary total given in Bulletin No. 1. and published in THE IRON TRADE REVIEW of Feb. 6, 1913.

The form in which the pig iron made in 1912 was cast or was delivered to open-hearth furnaces, mixers, etc., is given in an accompanying table, thus adding a new and valuable feature. Similar details for previous years were not collected.

Nearly 55.4 per cent of the pig iron made in 1912 was delivered to steel plants in a molten condition, over 2.12 per cent was sand cast, and about 23.4 per cent was machine cast, chill cast, etc.

In 1912 there were consumed in making the 29,726,937 gross tons of pig iron produced in that year about 35,721,127 net tons of coke, about 47,022 net tons of bituminous coal, about 73,794 gross tons of anthracite coal, and about 35,436,017 bushels of charcoal.

The bureau estimates the consumption of domestic and foreign iron ore, ore briquettes, etc., not including mill cinder, scale, scrap, etc., in the manufacture of pig iron in 1912 at about 55,656,000 gross tons, as compared with about 43,980,000 gross tons in 1911. The average consumption of iron ore in 1912 per ton of pig iron made was about 1,872 tons, as compared with about 1,859 tons in 1911. About 850,000 tons of iron ore are also annually consumed by rolling mills and steel works.

The limestone, including dolomite, consumed by the blast furnaces in the production of 29,726,937 tons of pig iron in 1912 amounted to 15,092,166 tons.

The production of pig iron in Canada in 1912, including ferro-silicon, ferro-titanium, and ferro-phosphorus, amounted to 912,878 gross tons, against 824,368 tons in 1911, an increase of 88,510 tons, or over 10.7 per cent.

On December 31, 1912, Canada had 19 completed blast furnaces, of which 14 were in blast and 5 were idle. Of the total 15 usually use coke for fuel and 4 use charcoal.

PRODUCTION OF HEAVY AND LIGHT SHAPES

States—Gross tons.	Heavy shapes.	Light shapes.	Total.
New York, New Jersey, and Penna.	1,968,967	204,650	2,173,617
Alabama and Ohio	6,818	66,323	73,141
Indiana, Illinois, Wis., Col., and Cal.	494,630	105,099	599,729
Total	2,470,415	376,072	2,846,487

PRODUCTION OF PIG IRON BY GRADES

Grades—Gross tons.	1911.	1912.	Increase.	Decrease.
Bessemer and low-phos.	9,409,303	11,664,015	2,254,712	.....
Basic (mineral fuel)	8,520,020	11,417,886	2,897,866	.....
Foundry and ferro-silicon	4,468,940	5,073,873	604,933	.....
Malleable Bessemer	612,533	825,643	213,110	.....
Forge pig iron	408,841	469,183	60,342	.....
Spiegeleisen	110,236	96,346	.....	13,890
Ferro-manganese	74,482	125,378	50,896	.....
White and mottled, direct castings, etc	45,192	54,613	9,421	.....
Total	23,649,547	29,726,937	6,091,280	13,890

MOLTEN AND CAST PIG IRON

States—Gross tons.	Molten condition.	Sand cast.	Machine cast.	Chill cast.	Direct castings.	Total.
Mass. & Conn.	.....	17,366	.....	.....	.....	17,366
N. Y., N.J., & Maryland	918,768	725,911	463,367	87,026	581	2,195,653
Pennsylvania	7,625,333	1,567,511	2,966,429	387,216	5,642	12,552,131
Va., Ala., and West Va.	674,361	1,456,182	225,763	35,201	1,701	2,393,208
Kentucky	.....	68,760	.....	.....	.....	68,760
Tennessee	.....	331,516	.....	6,697	25	338,238
Ohio	3,722,985	1,355,933	1,511,867	209,877	1,831	6,802,493
Indiana, Ill., Mich., & Col.	3,525,275	462,957	1,046,695	.....	802	5,035,729
Wis., Minn., Mo., & Cal.	.....	323,359	.....	.....	.....	323,359
Total	16,466,722	6,309,495	6,214,121	726,017	10,582	29,726,937

PRODUCTION OF PIG IRON IN CANADA

Years—Gross tons.	Bessemer pig iron.	Basic pig iron.	Foundry, ferro-silicon, etc.	Forge, etc., including ferro-alloys.	Total. Gross tons.
1900	3,781	9,720	72,589		86,090
1901	29,577	22,665	184,795	7,939	244,976
1902	9,253	107,315	165,466	37,523	319,557
1903	600	126,892	113,717	24,209	265,418
1904	26,016	70,133	155,035	19,758	270,942
1905	149,203	172,102	139,528	7,170	468,003
1906	165,609	246,228	124,361	5,759	541,957
1907	154,910	341,257	78,901	6,078	581,146
1908	112,811	335,410	109,471	5,980	563,672
1909	169,545	357,965	108,608	40,972	677,090
1910	221,494	365,090	143,986	9,640	740,210
1911	186,274	413,303	190,324	34,467	824,368
1912	228,742	489,799	194,208	129	912,878

PRODUCTION OF WIRE RODS

States—Gross tons.	1909.	1910.	1911.	1912
Mass., R. I., N. Y., and N. J.	280,101	246,669	244,300	258,680
Penna., Ky., Ga., Ala., and Ohio	1,388,237	1,412,352	1,585,973	1,806,720
Indiana, Illinois, and Colorado	667,347	582,809	620,180	588,153
Total	2,335,685	2,241,830	2,450,453	2,653,553

PRODUCTION OF SHAPES BY STATES

States—Gross tons.	1909.	1910.	1911.	1912.
New York and New Jersey	177,483	1,853,407	1,565,457	122,773
Pennsylvania	1,642,074			2,050,844
Alabama and Ohio	60,213	40,433	30,773	73,141
Ind., Ill., Wis., Col., and Cal.	395,792	373,050	316,137	599,729
Total	2,275,562	2,266,890	1,912,367	2,846,487

PRODUCTION OF CUT NAILS

States—Kegs of 100 pounds.	1912.			1911.
	Iron.	Steel.	Total.	Total.
Pennsylvania	179,869	330,935	510,804	559,550
West Virginia, Massachusetts, and Ohio.	.....	280,689	280,689	286,816
Kentucky, Indiana, Illinois, & Wisconsin	27,152	159,770	186,922	121,270
Total	207,021	771,394	978,415	967,636

PRODUCTION OF WIRE NAILS

States—Kegs of 100 pounds.	1909.	1910	1911.	1912.
Mass., R. I., and Connecticut	195,298	175,730	107,740	112,870
New York, New Jersey, and Pa.	6,113,353	5,457,099	6,485,729	7,389,861
Ky., Ga., Alabama, and Ohio	3,470,001	3,503,433	3,628,584	3,853,667
Indiana and Illinois	3,449,106	2,906,274	2,637,000	2,670,166
Wis., Colorado, and California	688,295	662,366	578,725	633,136
Total	13,916,053	12,704,902	13,437,778	14,659,700

APPROXIMATE CONSUMPTION OF SHAPES

Years. Gross tons.	Production of structural shapes.			Add imports.	Deduct exports.	Approximate consumption.
	Iron.	Steel.	Total.			
1900	815,161		815,161	*	67,714	747,447
1901	1,013,150		1,013,150	*	54,005	959,145
1902	1,300,326		1,300,326	*	53,859	1,246,467
1903	1,095,813		1,095,813	8,865	30,641	1,074,037
1904	8,019	941,127	949,146	7,203	55,514	900,835
1905	11,630	1,648,889	1,660,519	16,147	84,234	1,592,432
1906	4,719	2,114,053	2,118,772	28,573	112,555	2,034,790
1907	3,973	1,936,379	1,940,352	2,294	138,442	1,804,204
1908	2,423	1,080,758	1,083,181	3,623	116,881	969,923
1909	44,814	2,230,748	2,275,562	6,146	90,830	2,190,878
1910	426	2,266,464	†2,266,890	14,897	146,721	2,135,066
1911	811	1,911,556	†1,912,367	5,343	223,493	1,694,217
1912	5,517	2,840,970	2,846,487	3,120	288,164	2,561,443

*Imports of structural shapes were included with ingots, billets, etc., prior to 1903.

†Do not include some small forms of rolled iron and steel which were included as structural shapes in 1909 and previous years.

HEAVY PRODUCTION

Of Structural Shapes, Wire Rods, Cut and Wire Nails Last Year.

The bureau of statistics of the American Iron and Steel Institute has received from the manufacturers complete statistics of the production of iron and steel structural shapes, wire rods, and cut and wire nails in the United States in 1912. For 1911 and all previous years the statistics given below were compiled by the American Iron and Steel Association.

The production of beams, beam girders, zee bars, tees, channels, angles, and other forms of heavy and light iron and steel structural shapes in 1912 is separately given.

In 1912 there were 38 works in 10 states which rolled heavy or light structural shapes, as follows: New York, 2; New Jersey, 2; Pennsylvania, 20; Alabama, 1; Ohio, 4; Indiana, 3; Illinois, 3; Wisconsin, 1; Colorado, 1; and California, 1.

In 1912 over 10 per cent of our total output of structural shapes were exported, as compared with over 11 per cent in 1911.

The total production of iron and steel wire rods in 1912 amounted to 2,653,553 gross tons, against 2,450,453 tons in 1911, an increase of 203,100 tons, or over 8.2 per cent. In 1912 the steel wire rods rolled amounted to 2,652,264 tons and the iron rods to 1,289 tons, as compared with 2,449,843 tons of steel and 610 tons of iron rods rolled in 1911. Small quantities of steel copper-clad wire rods are included in the totals for recent years. The maximum production of wire rods was reached in 1912. The year of next largest production was 1911.

The production of cut nails and spikes cut from plates in 1912 amounted to 978,415 kegs of 100 pounds each, against 967,636 kegs in 1911, an increase of 10,779 kegs.

The production of wire nails in 1912 amounted to 14,659,700 kegs of 100 pounds, as compared with 13,437,778 kegs in 1911, an increase of 1,221,922 kegs, or nearly 9.1 per cent. Steel wire nails only were made in both years. The following table gives the output by states from 1909 to 1912 in kegs of 100 pounds.

The maximum export of wire nails was reached in 1912, when 1,530,353 kegs, or over 10.4 per cent of the total output, were sent abroad. In 1912 there were sent to Japan 535,211 kegs, against 553,776 kegs in 1911; to England, 166,484 kegs, against 73,871 kegs in 1911; to China, 146,029 kegs, against 143,338 kegs in 1911; to British India, 118,723 kegs, against 58,353 kegs in 1911.

Tremendous Foreign Field for Machine Tools

Described by E. P. Bullard, Jr., at New York Meeting—Results of Tariff Reduction Feared—Strictly Business Sessions

In a meeting that was marked by the absence of a program of formal addresses and by the large amount of time given to the purely business work of the organization, the National Machine Tool Builders' Association assembled for its sixth semi-annual convention at the Hotel Astor, New York City, May 15 and 16. The holding of the spring meeting of the association at a time and place most conducive to the dispatch of business, was an innovation in the affairs of the organization. Heretofore, much prominence has been given to fixed programs and to the opportunities for pleasure surrounding the semi-annual sessions, with the result that the work of the various machine committees was sometimes seriously interfered with. Upon this occasion, the arrangement of the various committees had been thoroughly perfected and sub-committees had been created in some of the more diversified designs of equipment represented, so that the deliberations of these respective bodies were simplified and faciliated. About 80 builders of machine tools were in attendance at the sessions.

Tariff Discussion

Tariff discussion, both formal and informal, came in for considerable attention at the meeting. The proposed reduction in the duty on machine tools from 30 to 15 per cent in the Underwood bill presented itself before the manufacturers as a matter of immediate seriousness and the opinion was voiced that, in some branches at least, the industry would in all probability be adversely affected in no small degree by this legislation. Wood Walter, of the Cincinnati Milling Machine Co., spoke to the members upon the status of the present bill. At the conclusion of his remarks, the association formally expressed its appreciation of his work in connection with the tariff legislation and also paid a vote of thanks to Henry E. Sharpe, of the Brown & Sharpe Mfg. Co., Providence, R. I., for his earnest and able representation of the interests of the machine tool builders before the ways and means committee of the house.

President E. P. Bullard Jr., of the Bullard Machine Tool Co., Bridgeport, Conn., in his opening address, referred to the changed conditions that the manufacturers were facing and laid emphasis upon the opportunities before the American machine tool industry for the extension of its trade into neutral foreign markets. In view of the reduced protection of the home markets, proposed in the pending tariff bill and the talk of the moment that increased efficiency in business is necessary to meet the changed condition, he believed that serious thought should be given by the association to the consideration of these matters. Mr. Bullard said he was impressed by the opportunities for the advancement of efficiency and the common benefit of the members through the medium of the various machine committees. As to foreign trade, he stated that there was a tremendous field yet to be developed by American machine tool builders in China, Japan, South America, South Africa and other countries. Some exports of American machine tools are now going to New Zealand and Australia. Mr. Bullard expressed the conviction that it was entirely within the province of the association to direct serious effort toward the winning of export business and toward devising aggressive selling plans along this line. The question of banking conditions which exercises much importance in foreign trading, he believes should be thoroughly investigated by the general manager of the association. Mr. Bullard spoke of the success of the German manufacturers as exporters, and referred to their methods of "plugging" for business. The Germans send representatives to the countries with which they desire to do business, and keep them upon the ground for years, thoroughly familiarizing themselves with the local conditions and with no thought of immediate returns upon the investment. He thought the association could be made a proper vehicle for work in this direction. Mr. Bullard spoke in appreciation of what the committee work of the association had been able to accomplish to bring about better conditions both for the manufacturer and the consumer. He referred especially to the lathe division.

R. E. Flanders, of the Jones & Lamson Machine Co., Springfield, Vt., made an informal and preliminary statement in behalf of the committee now considering the advisability of adding a mechanical section to the meetings of the association which would afford opportunity for the discussion of machine design and shop practice by the chief draftsmen, superintendents and foremen of the members. Mr. Flanders presented for the deliberation of members a number of points which had been brought up both in favor of and opposing this innovation to the association's work. It was the intention of his talk, he stated, to present these matters concisely before the members that they might give them individual consideration before the committee brings up the matter for final action, which is slated for the fall meeting.

Chas. L. Taylor, of the Taylor & Fenn Co., Hartford, Conn., as chairman of the patents committee, reported that no action had been taken at the last session of congress on the Oldfield patent measure, the provisions of which the committee had regarded as unfavorable to the interests of the machine tool builders in its report submitted at the last meeting. The committee stated that there was now pending in congress House Bill No. 1700, which includes many of the objectionable features of the former bill, in that it tends toward the establishment of patent monopoly and is in restraint of trade, which is repugnant to the temper of the business world at this time.

Commissioner of Patents

The association urged that the legal rights of inventors in patent matters be given more assured protection through the appointment to the office of commissioner of patents of one who possesses legal qualifications.

A tribute was paid by the adoption of appropriate resolutions to the memory and work of F. N. Gardner, president of the Gardner Machine Co., Beloit, Wis., who died a few days ago. A message of sympathy was also extended to F. E. Gardner, vice president of the same company, who is seriously ill. The resolutions committee was composed of J. W. Carrel, Lodge & Shipley, Cincinnati, J. G. Benedict, of the Landis Machine Tool Co., Waynesboro, Pa., and Winslow Blanchard, of the Blanchard Machine Tool Co., Cambridge, Mass.

MOB VIOLENCE

Resorted to by Strikers at Mt. Hope Mine, Wharton, N. J.

A virtual reign of terror has developed in the strike of the miners at the Mt. Hope mine of the Empire Steel & Iron Co., near Wharton, N. J., with the result that the operations of the property have been suspended and a condition of almost martial law now prevails in the neighborhood. During the latter part of March, as reported, the men struck for shorter hours and an increase in wages, although only a short time before they had been granted a 10 per cent advance. The company has shown a willingness to consider with the men the question of hours and wages, but the dispute has finally reduced itself to the question of the recognition of the Western Federation of Miners, the agitators of which organization were responsible for originally stirring up the men to strike. It has also been demanded that a number of employes who have remained loyal to the company should be discharged.

The company is combating this effort at union domination and the strikers have resorted to violence. Several armed battles have occurred between a posse of several hundred deputy sheriffs, who are guarding the property, and the strikers, and a number of persons have been wounded. In an outbreak a few days ago, 12 deputies were injured by bullets, necessitating their receiving hospital treatment. The height of violence was reached several nights ago when the strikers placed dynamite along the right of way of a four-mile railroad, which connects the mine with Wharton, N. J., and blew up the tracks. They also derailed a locomotive which strike breakers were attempting to operate. With its transportation facilities crippled, the Empire company has been forced to close its mine. The suspension of operations on the railroad also affects the Richards mine of the Thomas Iron Co. in the same locality, which has been shipping its ore over this route.

So acute has the situation become that the sheriff of the county has appealed for state militia to meet the emergency. Governor Fielder has this request under consideration, but has not yet taken any action upon it. In an effort to restore peace, the several hundred special deputies who have been on the scene for a number of weeks, have been withdrawn, as their presence seems to have inflamed the men to the adoption of desperate methods. The strikers treaten that any attempt to operate the mine will be a signal for further outbreaks of violence. As yet, the blast furnace operations of the Empire Steel & Iron Co. have been little affected by the strike. The Oxford, N. J., mines of the company continue as active as usual.

PEACEFUL SETTLEMENTS

Made in Many Foundries by Union and Employers.

The International Molders' Union of North America has been a party to peaceful settlements within the past two months with foundries throughout the country, affecting more of its members than during any year in its organization. Among its members that have reached satisfactory agreements in their respective cities, are the following:

Grand Rapids, Mich., No. 213, a flat minimum of $3.25 for a nine-hour day; Danville, Ill., No. 463, a flat minimum of $3.50 for a nine-hour day; Aurora, Ill., No. 137, a flat minimum of $3.50 for a nine-hour day, and 25 cents per day to all molders who have previously received $3.25 or over per day; Mt. Vernon, O., No. 143, a minimum of $3.25 for a nine-hour day; Worcester, Mass., No. 5, a minimum of $3.25 for a nine-hour day and 25 cents per day additional to those who have previously received $3.25 from the Holyoke Machine Co., the Wheeler Foundry Co., the L. W. Pond Co., the Standard Foundry Co., the Whitcomb-Blaisdell Co., and Rice, Barton & Fales. The American Locomotive Co. during this month also covered all its foundries, eliminating the differential which previously existed between the core makers and molders.

In April, the settlements were as follows: Pittsburgh, Nos. 46, 243, 270, 443 and 452, a minimum of $4.00 for a nine-hour day, which affects about 1,900 members; Akron, O., No. 30, a minimum of $3.40 for a nine-hour day. The settlement at the Pierce, Butler & Pierce foundry in Syracuse, N. Y., which had just been closed, was brought about by the agreement advancing the molders and core makers' minimum in the boiler department 10 cents per day, and the radiator molders 50 cents and the radiator core makers 35 cents per day.

Hugh Reid, senior member of the firm of Reid & Brown, structural steel and iron manufacturers, Toronto, Ont., died recently, aged 72 years.

IMPROVEMENTS

To Deforest Steel & Tinplate Co.'s Plant are Completed.

A number of improvements have been completed recently at the plant of the Deforest Sheet & Tinplate Co., Niles, O. These are as follows: A jobbing mill, making blue annealed sheets, 10 gage and lighter up to and including 48 inches in width; a galvanizing plant, which includes one large pot for 10-gage and lighter, up to and including 54 inches in width and one small pot for galvanizing very small sheets in tin plate sizes, the plant having six pots with accessories; four additional sheet mills, making a total of 10 in the plant; a power plant, consisting of a low pressure turbine of 1,250-kilowatt capacity with motor generator set and other accessories.

Among other additions to the plant during the past year are: A stamping department for the manufacture of all kinds of stamped articles from sheet metal; a culvert department for the manufacture of steel culverts; a reinforcement department for the manufacture of a concrete reinforcement for slab work, floors and roofs, sidings and for sheeting.

Labor Troubles at Pittsburgh

The spirit of unrest among foundry and mill employes in the various sections of the country has again cropped out at Pittsburgh, where about 2,000 employes, including a large number of molders, are on strike. About 650 foundrymen are out at the plant of the Pressed Steel Car Co., where molders have asked for an eight-hour day with ten-hour pay. More than 700 laborers at the Fort Pitt Malleable Co. are on a strike and in the neighborhood of 1,000 men, employed by the Superior Steel Co. are striking. Back of the several strikes is seen a well-defined movement on the part of trade unions to organize mill men in the Pittsburgh district. No violence has been experienced at any one of the plants and it is probable the men will return to work next week to accept wages that have been paid recently.

Advocates a Tunnel.—Sir Robert Hadfield, noted English engineer and scientist, advocates the construction of a tunnel under the English channel to bring France and Great Britain in closer communication. The project has been discussed for a number of years.

Modern Works Paradise Compared With the Old, Said President Farrell in His Testimony

Five Days Devoted to the Direct Examination Covering Many Phases of the Making and Selling of Steel and Iron Products

The chief feature of interest in connection with the examination of President James A. Farrell as a witness for the defense in the United States Steel Corporation dissolution suit was Mr. Farrell himself. Mr. Farrell occupied the stand for five days, during which he was subjected to questions concerning every angle of the iron and steel industry of this country and abroad. Throughout his examination, Mr. Farrell's quiet but strong and rugged personality entirely dominated the proceedings. The attorneys appeared to consider it a privilege to question him and he was treated with a courtesy and respect that has not been accorded every witness in this case. Naturally, the attorneys for the Corporation were more cordial toward him than toward witnesses for the government.

Mr. Farrell, who was but little known to the general public prior to the time that he assumed his present duties as president of the Steel Corporation, made the same impression that has characterized his previous appearances amid popular interest. He impressed his hearers as being a man of poise, a big man in a big job one who is able to cope with any situation that might arise, and who is sure to do the right thing at the right time. He also impressed all as a man who has a broad outlook on life, whose vision and judgment are unobscured by any pettiness of character. Lastly he impressed his auditors as a human being, a man who understands men and treats them with sincerity and kindness. As he sat on the stand, he looked like a man who can and is ready to do a big day's work, whether it be with mind or with muscle, and who disposes of his affairs without bluff or bluster and without pomp and ceremony.

In addition to his remarkable personality, Mr. Farrell possesses a knowledge of the iron and steel business in all its details which is truly amazing. The questions which were put to him called for a vast number of facts concerning every department of the business. These he answered in detail. His knowledge of manufacturing processes and of the market prices and conditions throughout the world was never at fault. His memory never failed.

Cordenio A. Severance, who conducted Mr. Farrell's direct examination for the defense, again showed his ability as a questioner. He brought out what was considered as evidence decidedly favorable to the Steel Corporation. Although working practically night and day and suffering from an abscess on a tooth, he scarcely showed the strain at the end of the week.

Mr. Farrell's cross examination was postponed and the stand was taken on Monday by Charles M. Schwab, chairman of the Bethlehem Steel Corporation. This action was agreed upon by opposing counsel in order to accommodate Mr. Schwab, who has made plans for a trip abroad. Mr. Farrell will undoubtedly resume the stand on the completion of Mr. Schwab's examination.

Judge Gary, chairman of the Steel Corporation, was present throughout nearly every session while Mr. Farrell testified. He closely followed the taking of the testimony. Other Steel Corporation officials present were John Reis, vice president; Ward B. Perley, Comptroller W. J. Filbert, Percival Roberts Jr., and General Agent John Hughes. Besides Mr. Severance, the legal array included Richard V. Lindabury, David Reed Jr., and Raynal C. Bolling for the defense, and Judge Jacob M. Dickinson and Henry E. Colton for the government.

Tells About Competition

In his testimony Wednesday, of last week, Mr. Farrell testified at great length in regard to the business of the various subsidiaries of the Steel Corporation in connection with that of competitors, the purpose of the testimony being to show that competition has thrived and independent companies have increased their capacity since the Corporation was organized. Mr. Farrell testified that the American Steel & Wire Co. previous to its purchase by the Steel Corporation was not in competiton with any of the other subsidiaries except for a limited tonnage of merchant bars and cotton ties. He said that the National Tube Co., at the time of the formation of the Steel Corporation, had 56 per cent of the steel pipe and tubular goods capacity of the country, while in 1912, the percentage was only 37. Taking into account the competition of cast iron and wrought iron pipe against steel pipe he declared that the National Tube Co. does only 23 per cent of the country's business in tubular goods.

The American Sheet & Tin Plate Co. exports tin plate principally to Canada, Mexico and Cuba and some to South America. The company has about 56 per cent of the country's production, but its competitors have all increased greatly and have built large plants. Its building program has consisted principally of rebuilding for economical reasons.

Plants of the American Steel Hoop Co., now operated by the Carnegie Steel Co., have also been rebuilt for economical reasons. Other steel hoop manufacturers have prospered greatly and several large independent plants have been built and are now building.

Taking up the American Bridge Co., President Farrell went through the defendant's exhibit No. 11, which was a list of the names of the competitors of the company. There were 374 of these, and Mr. Farrell recognized the names of more than 200 of these as concerns with which he had come in contact, either in selling them material or as competitors.

He said that building contracts are taken usually by competitive bidding. The American Bridge Co. has done much work for the government in the Philippines, and has done about $8,000,000 worth of work for the

government at Panama. The carrying out of large contracts often involves heavy expenditures. There are very few companies, for example, which could build a bridge like Hell Gate bridge, involving 40,000 tons of material and an incidental expense of perhaps $300,000, to get "false work" together. He said that about $54 per ton is the average price for fabricating and erecting steel in a large building. There are 24,000 tons in the Woolworth building. The erection of railway bridges is always by competitive bids.

The American Sheet Steel Co. was formed in 1900, and then had 15 competitors. At the present time. it has 36 competitors. It did 67 per cent of the sheet steel business of the country in 1901, which decreased to 36 per cent in 1911. The competition being met by the company is growing stronger all the time.

About Ferro-Manganese

Asked in regard to the manufacture of ferro-manganese, President Farrell said that it is made in blast furnaces, but with a lining different from that of furnaces making pig iron. On account of the small percentage of ferro-manganese used in steel-making, it is not economical for any except the largest steel manufacturers to make it.

The Illinois Steel Co. makes about 10 per cent of the track bolts of the country. The Carnegie Steel Co. did not start making car wheels until 1908. It has now an output of 300,000 steel wheels a year and makes about 30 per cent of the steel wheels of the country. When asked whether he knew of the Western Steel Corporation, Mr. Farrell said, "Yes, at present it is in the hands of a receiver. It was a realty operation. They had a small blast furnace, two open-hearth furnaces and some bar mills. They bought some Chinese pig iron."

Mr. Farrell said that the Otis Steel Co., Cleveland, is now building a $10,000,000 plant. The Upson Nut Co., Cleveland, was formerly a customer of the Carnegie Steel Co. It now makes its own steel. The Wheeling Steel & Iron Co. is large and growing, being an important competitor in pipe. La Belle Iron Works manufactures steel on a large scale. The Republic Iron & Steel Co. has a new open-hearth plant at Lansingville, near Youngstown, O. The Youngstown Sheet & Tube Co. makes steel on a large scale. The Andrews Steel Co. makes open-hearth steel on a pretty large scale. It sells a great many forging billets. The American Rolling Mills Co., Middletown, O., makes, said Mr. Farrell, what we call ingot iron which is steel, a roofing plate of open-hearth steel. It is good steel. The United Steel Co., Canton, O., has a steel plant. The Lackawanna Steel Co., Buffalo, makes about 1,300,000 tons of steel per year. The New York State Steel Co., Buffalo, has a blast furnce and two open-hearth furnaces. It is now in the hands of receivers.

The Tennessee Plant

Resuming the stand, Thursday morning, President Farrell continued to tell of the business of competitors and how it had increased during the past 10 years. He then gave a long list of competitors which have their own iron ore reserves.

Mr. Severance then offered in evidence a list of mills equipped to roll iron and steel merchant bars outside of the Steel Corporation. This exhibit shows that in steel bars the Steel Corporation has 40.1 per cent of the capacity of the country. The Corporation makes no iron bars. Of the total tonnages of iron and steel bars, 72.7 per cent are made by competitors of the Steel Corporation.

Taking up the plant of the Tennessee Coal, Iron & Railroad Co., President Farrell was asked whether the plant was equipped for the foreign trade at the time it was acquired. He replied that it was not, as it lacked suitable auxiliary machinery, finishing rolls, hot beds and other equipment. On the first order sent in after the company was taken over in 1908, $56,000 was spent on auxiliary mill equipment. This order was destined for Argentina and previous to this time, Mr. Farrell said, he had not heard of the Tennessee company as a competitor in the foreign business. Mr. Farrell said the condition of the Tennessee company as to efficiency at the time it was acquired by the Corporation could best be judged by the amount of money spent since, which was $23,500,000. On an order for 53,000 tons of rails, 27,000 tons were produced at a cost of $32.45 a ton, which was $3.45 a ton more than the selling price.

Mr. Farrell mentioned the Republic Iron & Steel Co., the Sloss-Sheffield Steel & Iron Co., and other concerns as competitors of the Tennessee company. At the time of its acquisition, the Tennessee company was not operating at a substantial profit. It employed largely colored labor and some convicts. The convict labor has been entirely abolished. In the year prior to the taking over of the Tennessee company, it earned an item of $150,000 as the result of a wage saving system, by which laborers took a discount of 10 or 15 per cent in order to get their money ahead of time. President Crawford, of the Tennessee company, discontinued this system immediately on the acquisition of the company by the Steel Corporation. The Tennessee company has not yet paid any dividends on its stock, but is getting into better position, as manufacturing costs are being lowered.

Being questioned in regard to the rerolling mills, Mr. Farrell said that the industry had had tremendous development in recent years, on account of the demand for reinforcing bars. The annual production of the country's re-rolling mills is from 500,000 to 600,000 tons. There are from 1,000,000 to 1,500,000 tons of scrap available every year for steel making.

Service of the Trade Papers

Mr. Farrell defined the term "market price" as a price at which the majority of the tonnage is being sold in the market. The market price is evidenced to the trade generally largely through the trade papers, which both seek and impart information. The market prices published by the trade papers are seldom criticised by either buyer or seller, at least in such papers as THE IRON TRADE REVIEW, *The Iron Age, The Daily Iron Trade, The American Metal Market* and *The Manufacturers' Record*. These are the authorities in the steel trade. They have offices all over the country and staffs of reporters especially trained for the work. There is no exchange in the iron and steel trade such as the cotton, wool or coffee exchange. Sellers of iron and steel are compelled to find their market and they do this through seeking orders. Through the trade papers, they get information from their customers as to what they are being quoted.

President Farrell testified that prices are very widely known in the trade, and that this knowledge and the knowledge of the existing producing capacity in the country of each line of iron and steel manufactured is most important to manufacturers. All such information is secured by sending out salesmen, through observing the general condition of business and through the trade papers.

"Do the trade papers publish information as to the new capacity being installed?"

"That is where we get most of it," replied President Farrell. "You can take any trade paper today or to-

morrow, or last week, and you can go through that paper, and it will detail the list of new construction and new plants. For example, one of the last issues of THE IRON TRADE REVIEW recited the fact that a large bridge fabricating plant was being built at Hope, Ark., and that the increase to the capacity of the open-hearth plant of the Pittsburgh Steel Co. was being contemplated."

Watches Competitors

President Farrell said it is a very important part of the business of the man at the head of a large steel plant to keep track of large contracts that are being made for additions to the producing capacity of competitors and similar matters. He continued:

"The Steel Corporation publishes price lists but not necessarily the flat price. The National Tube Co. and the American Sheet & Tin Plate Co. have price lists. The prices of our commodities are known to everybody who desires to know them. These price lists are frequently revised, but that does not necessarily follow. For instance, the price of bars has been $1.40 for several months now."

"Now, does the fact that a price remains at a uniform level for several months indicate anything as to whether the market is entirely a competitive market?" asked Mr. Severance.

"I object to that as incompetent," interjected Judge Dickinson, of counsel for the government.

"That is exactly what you asked your distinguished Dr. Francis Walker, in Washington," expostulated Mr. Severance.

"You objected then on the ground that it was not a question for expert testimony," remarked Mr. Colton, of government counsel.

"I objected on the ground that he did not know anything about it," replied Mr. Severance. "Here I have a witness who has very great knowledge of this matter."

President Farrell answered Mr. Severance's question by saying:

"Only in the minds of theorists and economists. The market during the past months that bars have remained stationary in price has been competitive, but the demand has exceeded the supply so the price has remained on about the same basis. Such a condition often happens, as there are regular cycles in the steel business."

Mr. Severance said he wanted something concrete in the way of an answer, and asked if, during the months since last summer that the price of bars has been on a level, there was any understanding, agreement or "pool" between steel manufacturers to keep the price there.

"No," replied President Farrell. "Most of our competitors have been getting premiums, selling bars at $1.50 to $1.60, but our price has been $1.40. These premiums have frequently been referred to in the trade papers. It is entirely the Corporation's custom to fill contracts in the order they are booked and never have any premiums been taken for prompt delivery. Sometimes our customers want prompt delivery and offer premiums to secure it, but we say: 'No, we shall deliver this in the order in which the contract was received.' Frequently they have bought material outside at premium prices and have endeavored to charge us with the difference; but our contracts are always made so that we have not been compelled legally or morally to pay any such differences."

Small Mills Run Up Price

"Then, again, there are a large number of small mills which come in on the 'boom' and sell above the market. This is particularly true in the east among plate and structural steel makers. There have been premiums of $8, $9 and $10 a ton paid during the last year. We never do that sort of business."

President Farrell mentioned tin plate and tubular products as instances of prices that have not changed much in the last few months. Since January, 1911, he has dictated the policy as to sales. During that time there has been no "pool" arrangement, understanding or contract of any kind fixing prices, limiting output or anything else by the Steel Corporation, or its subsidiaries. In times of large and active demand, it is the rule that smaller producers generally charge higher prices than large makers. Large ones steer a middle course on prices. In the case of a dull market, the small producer sells at less than the large producer. The policy of the Steel Corporation has been as far as possible to maintain stable prices.

Varieties of Steel Rails

Being asked in regard to steel rails, Mr. Farrell said that the price had been $28 a ton for a good many years, but only about 30 per cent of the rails bought during the past two or three years had been at that price, because specifications often call for open-hearth rails, rails made by the electric steel process, and alloyed rails. Manganese rails command a very high price. "We have," said Mr. Farrell, "just filled an order for the New South Wales government at $150 a ton. There are some in use in the subway here. These brought, I think, $120 a ton. The Pennsylvania railroad has its own rail specifications and buys from 250,000 to 300,000 tons a year. We charge them $30.55. We tried to get 30 cents more, but it was simply a case of merchandising. From the Lake Shore railroad, for the special analysis it requires, we get from 1.25c to 1.80c per pound."

"By the way," said Mr. Severance, "when former President W. E. Corey was a witness for the government, he testified that he received the impression from something you said to him that some arrangement had been made by you with foreign rail manufacturers by which it was agreed, or understood, that they would not sell in this market. What is the fact? Did you ever say that to Mr. Corey?"

"No. In fact at the time I told him I did not think foreign rail manufacturers would sell rails in this country."

"Was that your opinion?"

"That was my opinion."

"Why did you feel that way or have that impression?"

"Because we had a production of 5,000,000 tons a year in this country, of rails, and a duty of $7.84 a ton, and because of the natural idea that any large producer might have, that if material was dumped into his market there would be reprisals and dumping in another market; and it has always been our experience in the steel market when this vindictiveness is dis-

COMPARATIVE STATEMENT OF PRODUCTION OF TIN PLATE BY UNITED STATES STEEL CORPORATION AND ALL OTHER MANUFACTURERS IN UNITED STATES IN THE CALENDAR YEAR 1901

	Corporation.		Other manufacturers.	
	Tons.	Per cent.	Tons.	Per cent.
Total tin plate production. (As reported by American Iron and Steel Association	291,633	73.0	107,658	27.0
Eliminating from the foregoing the tonnage which was exported	.....	....	.....	....
Leaves comparative competitive production for the domestic trade	291,633	73.0	107,658	27.0

Domestic Consumption of Tin Plate

	Tons.	Per cent.
Produced by Corporation for domestic use	291,633	61.1
Produced by other manufacturers for domestic use	107,658	22.6
Imported for domestic use	78,014	16.3
Total tin plate for domestic use	477,305	100.0

played that it generally wreaks vengeance on the people who indulge in it."

Mr. Severance then wanted to know what President Farrell thought as to the advisability of steel manufacturers making large investment in plants having a substantial supply of ore in reserve.

Ore Reserves Necessary

"It is as necessary for the natural, normal development of the business to have ore and transportation facilities as to have the mills for the manufacture of semi-finished steel and the completed product. The Steel Corporation's ore from Wisconsin and Michigan moves over the Wisconsin Central, the Marquette and other railroads that do not belong to the Steel Corporation. Ore mined on the Mesabi range comes over the Great Northern as well as over the Corporation roads. From the lower lake ports to Pittsburgh, the valleys and Wheeling, this ore moves over various other roads in addition to the Bessemer & Lake Erie. Competitors of the Steel Corporation also shipped over these roads."

The witness explained that when he said it was necessary to own transportation facilities he meant that they were an advantage in lowering the cost of production. He named the large competitors of the Steel Corporation as steel manufacturers. He said he was familiar with their goods and their markets.

"What is your opinion as to whether the Corporation could, without committing financial suicide, itself put these large manufacturers out of the steel business?"

"It could not," replied President Farrell.

"Have you ever known or heard of a case where the Steel Corporation sold at a less price in a particular market in order to drive out a competitor, or has sought to obtain the custom of competitors by secret rebates?"

Never Gave Out Rebates

"No, not in a single instance, to my knowledge."

"What power exists by such means as I have just described? Has the Corporation other or greater power than is possessed by any of the other large concerns which you just mentioned?"

"It has none?"

President Farrell said it was an advantage to the Steel Corporation to have plants widely scattered in the country because the country's business is a zone business. He said it has been the policy of the Corporation in the last two or three years to maintain warehouses to take advantage of this zone business. There are manufacturers who are as well situated as the Corporation to take advantage of this zone business in certain lines of goods. The Corporation would be at a disadvantage in the metropolitan district were it not for the Waverly warehouse. Two million dollars worth of stock are carried at the Waverly. The Corporation is now establishing new warehouses at Galveston, San Francisco and St. Paul.

Service of the Warehouse

Mr. Severance then undertook to show that by this warehouse system the Corporation is in a position to be able to give the entire country an unparalleled service. The warehouse policy was inaugurated after Mr. Farrell became president. The witness told of economies made possible by having a large number of plants. It is now conserving 3,000,000 tons of coal a year by by-product coke ovens. He told of meetings of engineers and superintendents of the Corporation to discuss improved methods and suggest economies. Out of these meetings have come such results as briquetting of flue dust, the coking of coal that was never regarded as suitable, greater increase in the efficiency of the blast furnace, the utilization of low grade ores through the use of the concentrating plant at Colerain, etc. The officers and engineers of the Corporation are always looking for new and improved methods. The witness told of the difference of opinion between steel men and railroad men as to the composition of steel rails. The former feel they can make rails better suited to the railroads' requirements, but are forced to make them according to the specifications of the latter. The Corporation frequently loses an order because it will not make special analysis rails unless the railroad has inspectors in the mill to watch their manufacture.

Does Not Favor High Carbon

The Corporation is not in favor of high carbon in rails because it tends toward brittleness. But this view is opposed by railroad men. The Corporation's committee on rails is composed of the presidents of the rail-making subsidiaries. It has committees on sanitation and welfare matters; also a bureau that investigates all new processes. Some of its experiments are very expensive; no other manufacturers have conducted investigations on as large a scale as has the Steel Corporation. Cement is being made from slag, formerly a waste product.

President Farrell told about a great many new products in all lines which have been introduced and developed by the Corporation. He told about the laying out and building of the Gary, Ind., works, where $80,000,000 have been expended up to the present time, of which $65,000,000 were provided from earnings. He told about how $9,500,000 are being spent to build a new plant at Duluth. At McKeesport, Pa., the National Tube Co. plant has been entirely rebuilt at an expense of $13,000,000. A total of $14,000,000 has been spent in improving the Lorain, O., mills. The American Bridge Co. has spent $4,000,000 at Ambridge, Pa., in building a large bridge fabricating plant. A new rail mill is being built at Braddock, Pa., to replace the obsolete Bessemer equipment, $11,000,000 being spent there. Since the formation of the Steel Corporation about $424,000,000 have been put into all the plants for new equipment and extensions.

The Pittsburgh Base

The direct examination of President Farrell was concluded Friday afternoon.

The Pittsburgh base for the sale of iron and steel products, had been, said Mr. Farrell, a trade custom for over 50 years in the iron and steel trade,

COMPARATIVE STATEMENT OF PRODUCTION OF TIN PLATE BY UNITED STATES STEEL CORPORATION AND ALL OTHER MANUFACTURERS IN UNITED STATES IN THE CALENDAR YEAR 1911

	Corporation.		Other manufacturers.	
	Tons.	Per cent.	Tons.	Per cent.
Total tin plate production. (As reported by American Iron and Steel Association)	476,036	60.7	307,924	39.3
Eliminating from the foregoing the tonnage which was exported	62,307	100.0	.....	....
Leaves comparative competitive production for the domestic trade	413,729	57.3	307,924	42.7

Domestic Consumption of Tin Plate

	Tons.	Per cent.
Produced by Corporation for domestic use	413,729	56.2
Produced by other manufacturers for domestic use	307,924	41.9
Imported for domestic use	14,099	1.9
Total tin plate for domestic use	735,752	100.0

Pittsburgh being the center of the larger production of such products as well as of their sale. Selling prices in many cases the country over are based upon the Pittsburgh mill or furnace price plus the freight to destination. Chicago makers, for instance, have an advantage in selling into St. Louis or Omaha in charging Pittsburgh price plus the freight, by just so much as the difference in the freight charges between Chicago and Pittsburgh to destination. He testified that Birmingham, Ala., has for years been a basing point in the sale of southern foundry pig iron, being the largest producing center in the south for many years. For the same reason, Michigan charcoal furnaces are the basing point for the sale of charcoal pig iron. The Pittsburgh basing point has not always been strictly adhered to in that at times manufacturers have "absorbed some of the difference in freight".

The question of the one-time existence of "pools" in wire products, of which Mr. Jackson was supervisor, here came up. Mr. Farrell testified that, while there was general knowledge in the trade at one time of their existence, yet he never had personal knowledge of it. When Mr. Jackson called at his office in January, 1908, in company with Secretary Shippy, of the Roebling company, as a committee named by the wire association, he refused to see them. Afterward he had some "emphatic correspondence" with General Manager of Sales Frank Baackes, of the American Steel & Wire Co., regarding the refusal of the Steel Products company, of which the witness was then head, to be governed in its business dealings by any agreement between domestic manufacturers.

Employes as Stockholders

The witness testified that, compared with 22,000 employes of the Corporation who were owners of its stock at the time the answer to the government suit was filed, on May 1, 1913, there were 23,786 employes who are registered stockholders and in addition 21,630 others who are paying for stock on installments, of which number Mr. Farrell said he is one.

Welfare Work

Mr. Farrell gave a running sketch of the work accomplished by the Corporation over the last two years in sanitation and welfare work among its employes in its mills, mines, furnaces and ships. He read the following memoranda regarding it:

"Prior to 1910 the subsidiary companies of the Corporation were more or less active in sanitation and welfare work, each in its own way. In 1910, plans were evolved for conducting this work throughout the organization in a systematic manner. Under this arrangement there were expended during 1911, $1,250,000, and during 1912, $1,068,243. These expenditures covered disbursements for a wide range of purposes. Some of the most important are emergency hospitals, drinking water systems including sanitary fountains in the works, sanitary water closets, ventilating and cooling systems, plots of ground for vegetable gardens, improving dwellings, club houses for athletic purposes, swimming pools, baseball grounds, shower baths and children's playgrounds. The common drinking cup has been abolished."

He testified in greater detail respecting the hours of employment, actual working time, the hours for resting between heats, etc. Pointing out the difference between the care which injured men receive these days in Corporation mills compared with the days when he was a mill employe, President Farrell said:

"I can recall from my own experience that when a man was hurt at the works, if he was seriously injured he was put in a freight car and sent to the town, and sometimes put into a baggage car and taken into the town to a hospital. Most of the time, if he was seriously hurt, the hospital wasn't of much use to him."

Typhoid fever has been practically done away with in districts where formerly there had been a great deal. There are men now in the employ of the Corporation who have worked in its mills, large numbers of them, covering periods of 40 years and a great many 30 years.

Speaking of the installation of safety devices, etc., Mr. Farrell testified that at the mills, mines, vessels, etc., there was expended in 1911 and 1912 for safety devices $1,363,367, reducing the number of accidents among employes since 1906 about 40 per cent.

"The works," said Mr. Farrell, "are a paradise today compared with what they were in the old days.

"A great many of these things are put on because of our own desire to increase the safety of the men. We do not wait until a law is enacted before we do anything. * * * * They (safety devices) not only increase the efficiency of the men but result in their having better health and ability to earn more money, especially piece workers.

"We do not look upon it from a philanthropic standpoint, especially. It is an economic matter largely. We are doing the very best we can to decrease the cost of our production, and also the price of our commodities to consumers, and to maintain a high rate of wages in the industry, and to become generally as efficient as we can."

He then explained the institution and operation of the Corporation's pension system for all its employes, no matter in what sort of work they are engaged. This has all been set forth in detail in previous issues of The Iron Trade Review. Further, he declared that the Corporation's voluntary accident relief system, in addition to the pension system, "is a plan of relief similar to the workmen's compensation which went into operation, May 1, 1910, and this voluntary accident relief plan was instituted before any workmen's compensation law was enacted in the United States. * * * It results in more efficient work on the part of the men. It keeps them in a better condition of health, and also has its effect on their home influence."

Encourages Thrift

Referring to the employes' stock subscription plan, Mr. Farrell declared that in the past 11 years the Corporation has paid actually to employes $5,728,604.61 under the "special compensation" feature of the stock-selling plan, the total charge incurred by the

COMPARATIVE STATEMENT OF SHIPMENTS AND GROSS SALES (f. o. b. mills) IN EXPORT AND DOMESTIC BUSINESS OF THE UNITED STATES STEEL CORPORATION FOR THE YEARS 1904 AND 1912

	1904.	1912.	Per cent of increase.
Export shipments:—			
Gross tons	1,001,716.00	2,243,138.00	123.9
Selling value	$ 27,263,915.00	$ 76,812,253.00	181.7
Average per gross ton	27.22	34.24	25.8
Domestic shipments:—			
Gross tons; total including shipments of rolled material to Bridge company for fabricating, but excluding fabricated material	5,818,149.00	10,877,544.00	87.0
Selling value; total for the foregoing tonnage	$240,524,533.00	$397,379,085.00	65.2
Average per gross ton	41.34	36.53	11.6*
Domestic shipments of fabricated steel by American Bridge Co. on basis of completed contracts:—			
Gross tons	not available	466,511.00	....
Selling value	32,662,740.00	26,385,724.00	19.2*
Average per ton	.....	56.56	....

*Decrease.

Corporation under this head being $6,218,837.59. In the 11 years, employes had subscribed for an aggregate total of $30,596,400 par value of preferred stock, and $10,099,600 par value of common stock. On Dec. 31, 1912, a total of 32,248 employes were stockholders under the plan. Commenting upon the workings of this plan, Mr. Farrell said:

"It encourages a spirit of thrift among the men and results in their having greater interest in their work, and generally speaking increases their efficiency."

Seven-day Labor

That continuous seven-day labor has been abolished entirely in the Corporation's works was pointed out by President Farrell, although previous to the Corporation's formation "it was almost universal in the plants of the iron and steel manufacturers of the country * * * for 35 years at least. The first specific, definite direction for its abolition was in 1907". The series of resolutions of the finance committee of the Corporation regarding it was then gone into, all of which has been fully set forth at various times in THE IRON TRADE REVIEW. The witness declared that at various times officers of subsidiaries have sought to have the rule modified, but without success. These officers had been petitioned by their foremen and laborers to allow seven-day work, but it had been refused through the higher officers. Regarding the effect of these repeated refusals to change the rule, President Farrell said:

"We estimate that in the year 1912 over 4,000 of our workmen left our employ to accept positions with our competitors who were not concerned with the observance of the seven-day continuous work resolution. In some of our mills, I recall at Mingo Junction, O., for instance, a large steel plant, we had a number of mechanics and millwrights who had been in our employ a long time, in fact were in the employ of the company that owned the property before we purchased it—these men left our work because they could not work Sundays. A strange thing about a millwright or a mechanic is that he always wants to work on Sunday; I don't know why, it is a habit, I think.

"The Steel Corporation was the pioneer in inaugurating the abolition of the seven-day labor in mills, and the effort was continuous in our plants a long time before competitors took it up."

"Has that movement become more or less general now?" was asked by Mr. Severance.

"It was pretty general until the demand for iron and steel in the last year exceeded the supply. A great many of the other iron and steel manufacturers, I think, have not observed it quite so much as they did when they had insufficient employment."

Mr. Farrell spoke of the various regular meetings of salesmen, auditors, etc., of the various subsidiaries to compare prices, credit ratings of customers, cost sheets, etc., which he holds is a very important part of the Corporation's business.

Questioned about the so-called "Gary dinners", President Farrell said that he missed the first one because of being on the way to Europe at the time. He had attended some of the others, and on Jan. 11, 1911, one day after he had been named president of the Corporation, he had delivered an address before one of these dinners in which he said:

"I understand the policy of the Corporation to be to co-operate with its competitors in the effort to maintain fair prices and the stability of business conditions, by every means permissible under the laws of the country and not antagonistic to the public conscience."

Asked as to what he meant by that statement, President Farrell said that so far as he knew or had in mind there was never at any time "any agreement, express or implied, between the Corporation and its competitors to maintain any specific prices on specific products".

"What did you have in mind when you spoke of 'maintaining fair prices and the stability of business conditions'?" asked Mr. Severance.

"I had in mind the necessity of keeping our heads at a time when a chaotic condition existed in the country, and when our customers were loaded up with millions of dollars of goods which might, perhaps, in the case of a radical change in values, become involved in bankruptcy."

"During the time that these 'Gary dinners' were being held, from 1907 down to 1911, what was the fact as to whether you knew from your knowledge of business conditions in the country, were prices fixed and permanent on different commodities, or were they fluctuating?"

"Fluctuating."

"And were the prices made by different manufacturers identical, or were they fluctuating and different?"

"Fluctuating; not widely, but they were fluctuating."

Foreign Business

Describing the foreign business of the Corporation, President Farrell submitted the following figures pertaining to the proportion of the export and domestic consumption of the products of the Corporation for several years. On the basis of tonnage shipped, in 1911 the domestic consumption was 82.4 per cent; export, 17.6 per cent. In 1912, the domestic was 82.6 per cent; the export, 17.4 per cent. On the basis of selling value, f. o. b. mill, in 1911 the domestic was 84.5 per cent, and the export, 15.5 per cent; in 1912, domestic was 84.2 per cent, and export 15.8 per cent.

He then described the difficulties encountered in entering the foreign trade, merchants from English and continental concerns having "practically pre-empted" these foreign fields, many of them having been established there for as many as 50 years. Not only prejudice must be overcome by the newcomer, but "hostility in most cases".

"In order to get a foothold in these markets, what was it necessary for you to do in the way of prices?"

"We usually had to sell below the prices of the concerns that were established there, and which had their customers and native salesmen, and all the advantages that go with a long occupation of a business in any foreign country."

"Suppose a foreign market is used only for 'dumping' purposes, as you have testified it was formerly used by the American manufacturers, what position would that leave a manufacturer in who entered that market dur-

NUMBER OF EMPLOYES, AND PAYROLL OF U. S. STEEL CORPORATION

Year.	Number employes.	Total payroll.	*Average yearly wage per employe.
1902	168,127	$120,528,343	$716.88
1903	167,709	120,763 896	720.08
1904	147,343	99,778,276	677.18
1905	180,158	128,520,955	710.78
1906	202,457	147,765,540	729.86
1907	210,180	160,825,822	765.18
1908	165 211	120,510,829	729.44
1909	195,500	151,663,394	775.77
1910	218,435	174,955,139	800.95
1911	196,888	161,419,031	819.85
1912	221,025	189,351,602	856.70

*The advance in wages in January of this year raises the average yearly wage for 1913 to $912 per employe.

ing time of depression at home, for 'dumping' purposes, and then withdraws from the same and attempted later to get back?"

"It would leave the manufacturer in a very unenviable and undesirable position. In the language of the business, he would have to buy his way back by making very low prices, and it would simply be a recrudescence of what he had been going through before, selling at low prices. You cannot do foreign business without continuous, every-day supplying of the trade."

He declared that the business of maintaining stocks in foreign warehouses is "hazardous" because of "the fluctuations in the price", for prices might drop within a short time.

"Can a manufacturer having a large line of products for sale afford to maintain such warehouses and conduct that business, when a person manufacturing only one line of goods could not afford to do it?"

"It was tried by the National Tube Co. before the formation of the Steel Corporation. They established a large warehouse at Johannesburg, South Africa, and were obliged to abandon it for two reasons, one because of fluctuations in the prices of material, and the other because of the cost of doing business. It cost them over 8 per cent to do the business, because they had one line of goods only to sell."

"Has it sometimes happened that business was very much depressed in this country, while good in other countries?"

"It has happened frequently. It happened in 1910 and in 1911, and in 1903 also, and I know in 1897."

"In addition to that fact, what advantage is there in maintaining a continuous business all over the world?"

"The advantage of continuous operation of plants, advantage to the workmen in having employment, and the advantage from the standpoint of earning dividends for stockholders."

"Then you believe thoroughly in a world-wide business, where the corporation is big enough to do it?"

"Thoroughly."

This ended the direct examination of President Farrell, which had continued through five days.

Schwab Tells of the Corporation's Fair Dealing

Contrasts the Methods of Carnegie's Time With Those of Today—Large Independents Could Crush Competitors

Charles M. Schwab, chairman of the Bethlehem Steel Co., South Bethlehem, Pa., and the first president of the United States Steel Corporation, occupied the witness stand Monday in the United States Steel Corporation dissolution hearing. As was generally expected, when the announcement was made that Mr. Schwab would testify, he made an interesting witness in his characteristically good-natured way. He was questioned by Richard V. Lindabury, of counsel for the defense, and seemed inclined to answer questions at length, illustrating his remarks by characteristic gestures. Judge Dickinson, of counsel for the government, frequently offered objections and on one occasion entered into a short argument with President Schwab because he objected to the witness giving what he said were opinions instead of facts demanded.

Beginning his testimony with a graphic recital of the incidents centering around the formation of the Steel Corporation, Mr. Schwab entered into full discussion of its policies in its early history. He made the point that never has the Steel Corporation sought purposely to injure any competitor, large or small, that it has encouraged the growth of competitors rather than discouraged it, and that the independent steel makers have now prospered and grown to such a point that it is impossible for the Steel Corporation itself to destroy them. Rather, he declared it far easier for the larger independents to cripple or destroy the smaller concerns. He defended the early Lake Superior ore purchases of the Steel Corporation, made when he was president, and declared that today with all its large holdings, the Steel Corporation does not possess as much ore property as he believes it should. Further, he declared that while he was president, Chairman E. H. Gary never knew of the once-popular but long since discarded "pools" and that he, the witness, purposely kept such information away from Judge Gary. As one well fitted by his years of experience gained in high position, and careful study of every mood of the markets and exact knowledge of the progress of iron and steel manufacture, Mr. Schwab gave some exceedingly interesting testimony regarding the differences in trade practice between what he described as the "old days" when Andrew Carnegie was in the saddle, and the present-day business methods observed in the iron and steel trades.

Mr. Schwab first told about the part he took in the negotiations leading up to the formation of the Steel Corporation. J. Pierpont Morgan first became interested in it through a speech which Mr. Schwab made at a dinner in New York in which he told of the great possibilities for such a concert

TONNAGE OF EXPORTS OF IRON AND STEEL PRODUCTS BY UNITED STATES STEEL CORPORATION

(All figures in gross tons).

	1902.	1903.	1904.	1905.	1906.	1907.	1908.	1909.	1910.	1911.	1912.
Pig iron	1,240	.....	10	.....	.....	.....	17,698	7,337	6,500	14,347	37,221
Scrap, iron and steel	1,402	1,178	.....	.....	.....	.....	4,200	1,000	474	12,298	9,133
Billets, blooms and ingots	107	12,714	316,030	238 696	199,467	75,297	118,425	96,000	63,113	236,587	264,786
Steel rails	30,382	55,336	253,588	189,910	226,311	226,310	126,369	223.152	271,233	333,118	392,438
Wire rods	36,509	26,659	29,933	13.761	14,949	8,743	10,119	22,132	23,029	18,486	60,021
Steel bars, hoops and bands	6,181	11,435	33,329	29,080	53,467	66,071	36,629	60,542	102,310	108,544	175,269
Plates and sheets, I. and S. (inc. skelp)	10,070	19,681	82,357	117,049	140,331	156,207	111,641	176,793	252,331	331.419	505,225
Structural shapes and work, I. and S.	15,760	18,721	40,132	61,747	87,832	109,773	95,095	87,045	118,947	178,480	227,485
Tin and terne plate	1,150	228	8,776	8 046	13,425	11,078	12,842	12,125	17,545	62,307	74,919
Wire, barbed	54,753	54,467	61,625	79,494	79,124	70,919	59,813	68.707	70,282	84,170	80,199
Wire, all other	38,858	51,029	46,184	60,883	81,178	77,195	62,154	69,319	74,615	100.705	115,667
Wire nails, cut nails, tacks and all other nails and spikes	30,663	37,838	38,725	39,512	46,089	42,116	30,541	35,886	51,380	59,602	71,276
Pipe, tubing and fittings	40,918	52,141	64,771	67 878	81,209	116,538	70,894	99,098	110,489	125,528	183,073
Total for above commodities	267,993	341,427	980,460	906,056	1,023,382	960,247	756,420	959,136	1,162,248	1,665,591	2,196,712
Other sundry iron and steel products of classes which government statistics do not show separately or specifically	7,840	9,397	21,256	22,843	26,335	24,794	18,925	26,338	33,217	42,896	46,426
Grand total	275,833	350,824	1,001,716	928,899	1,049,717	985,041	775,345	985,474	1,195,465	1,708,487	2,243,138

should it be formed. He told Mr. Morgan that he thought he could get an offer to sell the Carnegie Steel Works from Andrew Carnegie. Twice before that Mr. Carnegie had given written options for the purchase of the Carnegie Steel Co., the first time to H. H. Rogers, and the second to Judge W. H. Moore, the latter for $320,000,000. As neither of these sales had materialized, Mr. Carnegie refused to give another written option, but he told Mr. Schwab upon what terms he would sell, and the latter communicated them to Mr. Morgan, who accepted them. Mr. Schwab testified that he did not take a part in the actual negotiations for the purchase of the other subsidiaries, but he advised what should be done, and this advice was generally followed. The taking over of the Jones & Laughlin Steel Co., the Cambria and the Pennsylvania Steel companies were discussed at the time, but Mr. Schwab declared against their acquisition, as they would not add to the efficiency of the Corporation. What Mr. Schwab wanted, he testified, was an "integrated" corporation, having diversified products and having mills specializing on each product. He wanted the Steel Corporation formed for the possession of large raw material supplies, a complete line of finishing mills making for the reduction of overhead expenses, specialization of men and mills, and development of the export trade. The result, said Mr. Schwab, was so successful as to exceed his expectations.

Don't Seek Export Business

Competitors of the Steel Corporation have not developed in the export business, said the witness, and most of this is done by the Corporation itself. The former have developed in the domestic business, however. The Corporation's example in advancing the wages of its employes has been followed by its competitors.

Mr. Schwab declared that he never knew of the Corporation having both secret and published prices on its products. He, as president of the Corporation, gave prices to The Iron Trade Review and the Iron Age every week, and these published prices were the ones upon which the Corporation did business. He mentioned these papers, he said, as the authorities in the iron and steel trade. Mr. Schwab declared that he never heard of the Corporation selling at a lower price in order to drive competitors out of business. He declared that the Corporation does not have the power to drive large independent companies out of business now. It is different from the old days of the Carnegie methods.

"We did everything then that we could to secure all the business we could, regardless of price or regardless of conditions under which we secured it, providing they were honest," said Mr. Schwab, with a reminiscent smile. "It was pretty hard on our competitors at times."

He had no knowledge of the formation of "pools" after the Steel Corporation was organized; the then existing pools were "holdovers." He received a call from Mr. Jackson, supervisor of oldtime "pools," who explained his arrangements for "pools." Mr. Schwab told Mr. Jackson he did not approve of them, and he never heard of the latter again. Mr. Schwab declared that he always believed in pools and formerly extended every aid in the effort to form them. He attended meetings of the "plate pool" after the formation of the Corporation.

"Judge E. H. Gary never had anything to do with them; in fact, he was opposed to them when I was president of the Corporation," said Mr. Schwab. "One of the things I had to contend with was Judge Gary's opposition to these things that I had been so long accustomed to."

"How did you manage it?"

"I did it without his knowing anything about it."

There were no very definite pools, said Mr. Schwab, after he left the Corporation in 1903. He said there were no penalties levied by the pools after 1901 that he remembered.

The witness declared that the Corporation's policy always was to charge the low market price in prosperous times and the high market price in times of financial depression. The theory was that this would prevent buyers from speculating in material and would cause them to buy their requirements as they actually needed them. He said that about 75 per cent of the steel rails made now are openhearth. The Bethlehem Steel Co. sells openhearth from $30 to $35 a ton on the average. He pointed out that it costs more to make rails now that it did ten years ago, even if the selling price remains the same. He was asked to explain the $28-ton price and said:

"It is generally regarded as right and fair, and there has been and is likely to be no change. I would not reduce the price 5 cents at Bethlehem Steel Co.'s works for two reasons: first, it would not give me any more business as the railroads always buy from contiguous plants irrespective of price; and second, other railroads would make my competitors sell at the same prices, which would give rise to an awkward situation."

He testified that it costs the Bethlehem Steel Co. more to make rails than the Steel Corporation on account of the ore transportation costs, etc. Mill costs are practically the same, however, all over the country, $10 per ton for converting pig iron into rails. This does not include overhead charges, interest on investment, or depreciation, which is very heavy because of the machinery constantly becoming obsolete.

Should Have More Ore

Mr. Schwab said that the Lake Superior Consolidated Iron Mines property was worth the price paid for it by the Corporation, and that he advised its purchase because of his strong belief in the future of the iron and steel industry, and he thought the Corporation should be well fortified. He believed that the Corporation ought to have more ore than it now has. When Mr. Schwab was president, he advised the purchase of additional ore properties that were recommended by James Gayley. The refusal of the finance committee of the Corporation prevented this.

"In the early days," said Mr. Schwab, "our finance committee was reluctant to spend money for things of this sort or improvements to plants even. The members of the committee had not been educated to know the manufacturing business as I knew it."

When Mr. Lindabury asked if any iron ore was ever purchased for the purpose of securing a monopoly in this material, Mr. Schwab very decidedly answered "no." He said the question of monopolies in any branches of the business, while he was president of the Corporation, was never broached. The Steel Corporation never sought to suppress competition or restrain trade. He said that the Corporation only endeavored to get better manufacturing plants than other people had.

The Steel Corporation, so Mr. Schwab testified, never purchased plants with a view to dismantling them, and never dismantled any unless they were obsolete or unless there were two in the same district. The property schedule of the Corporation's ore holdings in 1901, said Mr. Schwab, placed its valuation at $1 a ton in the ground. He mentioned the ore reserves accessible to this country, and said they are ample to supply a number of new steel works which would duplicate the present capacity of the country.

No foreign rail pools ever existed to his knowledge, said Mr. Schwab, adding with a laugh:

"I should have made such an agreement in the early days before 1901 if we had had rails to sell abroad, or if I had had anything to base any agreement on."

He said that Andrew Carnegie wanted to sell out his interests in the Carnegie company in order to devote his life and money to philanthrophy. The other partners wanted to sell because they thought the company would not be strong without Mr. Carnegie.

Influence is Balance

It would be easier for the large independent companies to put the small concerns out of business than for the Steel Corporation to do it as the independents are circumscribed as to locality. In the old days, he said, they used to put the weak and small out of business, and there were few survivors. The Corporation tends to bring about fewer failures and to carry along the smaller concern. The Corporation never exercised more than a moral influence upon prices. Its influence was always a great steadier and a balance. He told of the so-called "Gary dinners", saying that the keynote of the first dinner was a speech by Judge Gary, advising manufacturers not to lose their heads. The committees appointed never fixed prices or made agreements. There has never been a factor in the steel business which so stimulated healthy growth and competition as has the Steel Corporation. He said that the purchase of the Shelby Steel Tube Co. was made because that concern had the most efficient method of manufacturing tubes, not for the purpose of forming a monopoly.

In his cross-examination by Judge Dickinson, of counsel for the government, Mr. Schwab said that the National Tube Co. made seamless tubes but by a different process than the Shelby company. He said that the Corporation could have built new works instead of taking over the Shelby mills.

Judge Dickinson questioned Mr. Schwab about the market reports that he gave to The Iron Trade Review and The Iron Age, and wanted to know if these market reports were published in the form of announcements. The latter said "no." Judge Dickinson evidently wanted to find out if there were ever any "inspired" reports published.

Judge Dickinson then read from old records of the Carnegie company, showing the existence of various rail "pools". These extracts showed how the Illinois and Carnegie companies juggled figures in order to retain their allotments when others increased their manufacturing capacities; also how they paid others to stay out of the rail business; and how the Maryland and Pennsylvania steel companies received $100,000 in 1907 in payment for a decrease in their allotments. These extracts also showed how orders were sometimes transferred from one company to another, and how in the old days the rule that a railroad buys from contiguous plants did not hold. Even the Colorado Fuel & Iron Co. was in the rail "pool." He read one extract from a letter by John G. Leishman, who complained that the Carnegie company was paying too much "blood money," nearly $1,000,000 a year. The "blood money" was the money that went to those who threatened to make rails, said Mr. Schwab. He read another extract, showing the existence of an old agreement between the Carnegie and Illinois companies regarding foreign rail sales. This contradicted the previous testimony.

More Time Given to Protesting Manufacturers

By the Senate Finance Committee—Final Action on the Tariff Bill May Not be Taken Until September—Proposed Amendments

Attacks by Republicans in the senate on secret consideration of the tariff bill by the senate finance committee have yielded results. Although the Penrose-LaFollette amendment for public hearings was defeated last Friday by a vote of 36 to 41, debates on the proposal forced the Democrats to change their methods, and Senator Simmons, chairman of the senate finance committee, has announced that more time will be given to protesting manufacturers by the subcommittee at the private hearings. Now the Democrats have also promised to allow members of the press to be present at the hearings. Senator Hoke Smith, of Georgia, said on the floor that he was perfectly willing to have hearings of the cotton and chemical schedules, in charge of a subcommittee of which he is a member, taken down by a stenographer. Other subcommittees may adopt the same plan. Senators LaFollette and Bristow are credited with the Republican victory compelling the Democrats to give way to popular demand.

The hearings not only will be published but 16 questions propounded in Mr. LaFollette's amendment to Senator Penrose's amendment for public hearings will be sent to manufacturers of the country for answer. These questions deal with costs and production.

Hearings of subcommittees were begun yesterday under a more comprehensive and specific plan than heretofore, the finance committee having awaited the result of the vote on the public hearing amendment before going into the investigation of the schedule on a thorough basis.

Included in the subcommittees taking up hearings is that in charge of the metal schedule, of which Senator Stone, of Missouri, is chairman.

Proposed Changes

While numerous changes are apparently to be made in the metal schedule, it is improbable that cuts in the measure as it came from the house will be as radical as some reports would indicate. None probably will be of such a nature as to interfere with President Wilson's stand to see, if possible, that his wishes for the construction of the measure are regarded.

It already has been voted by the sub-committee in charge of the metal schedule to reduce the duty on ferro-manganese from the 15 per cent rate provided in the bill as it passed the house. It is claimed consideration is being given to cutting it to $2 a ton. The present duty is $2.50 a ton.

No doubt exists that many amendments will be offered to the metal schedule by Republicans along with changes they will propose in other schedules.

Senator Oliver, of Pennsylvania, has already had three amendments referred to the committee on finance, which he will propose at the proper time.

Proposed Amendments

One provides for the continuation of the present duty on ferro-manganese, a second would restrict by specific description, the paragraph in the Underwood bill which embraces cotton ties, put on the free list, but is so general that it takes in similar commodities under the terms of "hoop or band iron, hoop or band steel." The Oliver amendment provides for cotton ties only. The other commodities would go to the basket clause, carrying a 25 per cent ad valorem duty if the Oliver amendment were substituted for the Underwood paragraph. The third proposal made by Mr. Oliver would strike out the free wire paragraph, and revert wire products to the basket clause.

Reports as to the number of changes the finance committee will make in the bill, and other questions affecting it, are made one day only to be followed by conflicting reports the next. It seems to be the general belief, however, that no great changes will be made, with perhaps a few exceptions, sanctioned by the administration. The number of changes has been estimated all the way from 100 to 500, showing the wide range of theories and speculation.

It will probably require at least two more weeks before the sub-committees have completed consideration of some schedules. The next step will be a consideration of the measure as a whole by the majority of the committee, and then it will go to the Democratic caucus. The consideration of the bill next by the entire committee will be purely a formality. It is thought the bill will not be reported to the senate before the middle of June. The measure will be fought on practically every paragraph by the Republicans and it would not be surprising if it did not finally pass before the first or the middle of September. Consideration

Regardless of a tendency of at least one senator on the finance committee, and Senators Thornton and Ransdell of Louisiana, to protest against the free sugar provision, it is probable the president's desire for adoption of this schedule and that referring to wool as now incorporated will prevail. Further evidence of the president's influence is shown by the fact that Democrats of the senate have virtually agreed to hold a binding caucus instead of a conference, which would give free sway to rebellious senators. Pressure from the White House is not being enjoyed by members of the finance committee, but is being received with outward signs of graciousness. It is the shattering of another precedent, the old time prestige of the finance committee. The committee will lose none of its standing, though, if changes are made in the caucus, after the majority members of the committee have completed their deliberations. In the house such changes were made only by permission of Mr. Underwood, who was completely in charge of his party.

Insurgency in the Democratic ranks has been theratened by more than the two Louisiana members. Senators Newlands and Pittman, Nevada; Walsh, Montana; and Marvus Smith, Arizona, have displayed emphatic disapproval of the bill because of the free sugar and free wool provisions. Mr. Newlands, in an address on the floor last Friday, pending the vote on the public hearing amendments, said he might be compelled to withdraw from the party on the tariff bill vote and attacked the president as being inconsistent on the free sugar item. The administration was defended by Senator James, of Kentucky. When the test comes, however, it is expected to see all the Democrats, with the exception of the Louisiana senators, in line. This would cut the Democratic majority to four, which seems safe.

NEW ASSOCIATION

Will Promote Interests of Manufacturers of Refractories.

Closely following steps taken a number of years ago by industrial and manufacturing interests of all types in this country, about 40 of the leading manufacturers of refractories in the central, western, and eastern states have perfected an organization known as the Refractories Manufacturers' Association, as stated in THE IRON TRADE REVIEW of April 24.

Manufacturers of refractory products have long felt the need of an organization that would bring them into closer personal and social relations with their competitors. Although such an organization had been discussed for a number of years, the project remained in an embryonic state until the early part of the present year, when renewed interest was taken in the movement.

The new organization is similar in many ways to those maintained by other business interests throughout the United States. At the recent meeting, a constitution was adopted, and officers were elected. Any individual or company, engaged in the manufacture of refractories is eligible to membership and it is probable that the membership roll eventually will contain the names of every prominent official identified with the trade.

The purpose of the organization is "to promote closer relations between manufacturers, dealers and consumers of all kinds of refractories; to improve the products of its members; to standardize, as far as possible, the various designs and shapes of products manufactured; to endeavor to secure the most equitable freight rates for manufacturers and consumers; and to promote social intercourse among its members." It is the intention of the organization to secure some of the most prominent ceramic experts, engineers and manufacturers in the country to make addresses.

H. D. Savage, of the Ashland Fire Brick Co., Ashland, Ky., and John H. Cavender, of the American Refractories Co., Chicago, were elected president, and secretary and treasurer, respectively, of the association. It is the ultimate intention to have a testing laboratory and other equipment for the association.

The executive committee, composed of nine members, is as follows:

Missouri—J. L. Green, Laclede-Christy Clay Products Co., St. Louis.

Illinois—C. S. Reed, Chicago Retort & Fire Brick Co., Chicago.

Kentucky.—E. S. Hitchens, General Refractories Co., Olive Hill, Ky.

Southern Ohio—D. D. Davis, Davis Fire Brick Co., Oak Hill, O.

Northern Ohio—T. E. Thomas, Niles Fire Brick Co., Niles, O.

Western Pennsylvania and West Virginia.—J. H. McFeely, McFeely Brick Co., Pittsburgh.

Central Pennsylvania. — Geo. H. Diack, Queen's Run Fire Brick Co., Lock Haven, Pa.

Maryland—C. H. Claiborne, Union Mining Co., Mt. Savage, Md.

New Jersey and New England—Cyrus Borgner, Cyrus Borgner Co.

It is the general feeling of all concerned that the association will be of great benefit, both to the manufacturer and consumer, not only in such matters as the improvement of quality and character of the product of its members, but also in working out and putting into effect, efficient methods of manufacture, reduction of costs, standardization and all other problems of common interest to this important industry.

Canadian Car & Foundry Co. Improvements

The Canadian Car & Foundry Co., Ltd., Montreal, Que., is proceeding with its new plant at Fort William, Ont. This plant will be one of the largest car plants in the Dominion, modernly built and equipped in every respect, practically fireproof and will have capacity for all kinds and classes of both wood and steel freight car equipment. It will also have its own foundries, spring shop, etc.

The Turcot and Dominion plants in Montreal have been enlarged considerably to meet the growing requirements of business. The capacity of both plants has been practically doubled within the last three years. The company's plant at Amherst has also been enlarged, all new construction work being of a permanent character. At present the company is putting up a plant for the manufacture of steel car equipment, including bolsters and brake beams, as well as a spring shop. The malleable foundry at Amherst has been enlarged to nearly three times its original capacity.

Considerable improvements have have been made to the Welland plant of the Canadian Steel Foundry, Ltd., the stock of which company is entirely owned by the Canadian Car & Foundry Co., Ltd. The latter company also recently purchased by stock ownership the malleable fireproof plant of the Pratt & Letchworth Co., at Brantford, Ont.

The company has orders on its books at the present time sufficient to keep its plants going for the remainder of the year.

Machinery Shipped to Japan

The Westinghouse Electric & Mfg. Co., Pittsburgh, has shipped a train of 25 freight cars containing a large amount of machinery to Tokata & Co., Tokio, Japan, where it will be installed in the Inawashiro Hydro Electric Power Co.'s plant, 145 miles from Tokio. The electric current will be transmitted to Tokio after being generated by water turbines. The plant will be modern in every particular. It is proposed to develop a current at the power plant under low voltage and, by step-up transformation, raise the current to 115,000 volts. At Tokio, the current will again be reduced in voltage and used for light and power purposes in that city. The consignment included eight 4,000-kilowatt transformers, two motor generator sets, and a large amount of switchboard material. The machinery, which weighs 913,976 pounds, was shipped to Tacoma, Wash., where it will be loaded into Pacific steamships for transportation across the ocean.

Will Blow in New Stack

Announcement is made by the Woodward Iron Co., to the effect that the new 400-ton capacity furnace under erection at the Woodward, Ala., plant will be completed and blown in about August 1, and that after that date, the Woodward plant will have a daily output of some 1,200 tons of foundry grades. The coke required for this output will be furnished from the battery of Koppers by-product ovens, the addition to which is just being completed.

Mills Resume.—The mills of the Phillips Sheet & Tin Plate Co., at Weirton, W. Va., have resumed operations after an idleness of about six weeks caused by boiler and power house plant being damaged by a landslide. Very extensive improvements have been made and the plant is again in good operating condition.

The Pittsburgh local committee of the Society of Automobile Engineers of America will entertain members of the Institution of Automobile Engineers of England, May 29. The program includes visits to the plant of the Carnegie Steel Co., at Homestead, and the McKeesport plant of the National Tube Co.

MEN OF THE IRON TRADE

GANO DUNN has been elected president of the J. G. White Engineering Corporation.

S. M. VAUCLAIN, vice president of the Baldwin Locomotive Works, was recently elected a director of the Bucyrus Co., South Milwaukee, Wis.

I. S. KEELER and C. P. Moore have been made directors of the General Electric Co., succeeding J. Pierpont Morgan and J. P. Ord, both deceased.

FLETCHER COLLINS, formerly associated with Naylor & Co., is now identified with the Banning Cooper Co., Ltd., Oliver building, Pittsburgh.

JOSEPH G. BUTLER JR., vice president of the Brier Hill Steel Co., again has been elected president of the Youngstown, O., Chamber of Commerce.

J. K. HAIGH, for 10 years connected with the Buffalo office of the Snow Steam Pump Co., has been transferred to the company's Los Angeles, Cal., office.

PAUL G. RAHE, secretary and geenral manager of the Central Radiator Co., Lansdale, Pa., recently returned from a business trip through England and Germany.

SIR WILLIAM MACKENZIE, president of the Canadian Northern railway, returned to Canada from England, and says he has obtained ample funds to carry on projects now under way.

E. C. HANRAHAN, Chicago, who has been secretary of the National Association of Stove Manufacturers, has retired to become general manager of the Favorite Stove & Range Co., Piqua, O.

EMIL J. BAUER will succeed Arthur J. Gyrmes as manager of the lighterage and foreign freight departments of the Erie railroad, with offices in the Produce Exchange building, New York City.

H. H. IVES, for the past three years associated with the Pittsburgh office of the Charles Dreifus Co., dealer in old material, has become connected with the Philadelphia office of the same firm.

THOMAS J. JOYCE, formerly of the firm of the Domhoff & Joyce Co., Cincinnati, pig iron and coke brokers, has gone to Portadown, Ireland, on a combined business and pleasure trip that will last several months.

C. W. MARTIN has recently been promoted from hot mill superintendent to general superintendent of the Deforest Sheet & Tinplate Co., Niles, O. Samuel Brown succeeds Mr. Martin as hot mill superintendent.

ABRAM COOKE has resigned his position as secretary and treasurer of the Southern Car Co., High Point, N. C., and sold his interest in that company. Mr. Cooke has been an important factor in the success of the Southern Car Co.

FRANK H. OLISKIE has secured a patent on a rail made in two parts, the lower part of which is spiked to the ties in the ordinary manner. The head of the rail is moveable. He is employed in the railroad department of the Cambria Steel Co., Johnstown, Pa.

A. H. CHAVE, formerly general purchasing agent of the Canadian Car & Foundry Co., Ltd., Montreal, Que., has been appointed assistant to the executive, and V. G. Curry, vice president, has taken charge of the purchasing department, in addition to his other duties.

DANIEL W. MEAD, consulting engigineer and professor of sanitary and hydraulic engineering at the University of Wisconsin, Madison, has been appointed to act for the city of Peru, Ind., and the railroad officials for the construction of a new bridge over the Wabash river at Peru.

R. S. UTLEY, Pittsburgh manager of the Penn Machinery & Equipment Co., Oliver building, has resigned to accept a position with the Aberdeen Lumber Co., Pittsburgh. He has been succeeded by Maxwell W. Scott, formerly connected with the Commonwealth Electric and Supply Co., Pittsburgh.

CHARLES H. GREEN, Ridgewood, N. J., has been appointed chief of the department of manufactures and varied industries of the Panama Pacific International Exposition, and has assumed active charge of that section of the

CHARLES H. GREEN

fair. Mr. Green is no novice in exposition work, having been engaged in that line for the past ten years. In that time he has been connected in various capacities with more than 40 industrial expositions and trade shows. He was manager of the Boston Mechanics' exposition, the National Textile exposition, New York, the Brooklyn Automobile show, and the National Piano Trade exposition of Chicago.

W. W. GREGG, until recently works manager of the Hayes Mfg. Co., Detroit, is now manager of the Harrow Spring Co., Kalamazoo, Mich. Prior to going with the Mayes Mfg. Co., Mr. Gregg had for many years been connected with the interests controlling the Harrow Springs Co.

GULFORD D. SCHOLL, formerly of the United States Metals Refining Co., at Chrome, N. J., has accepted the position of assistant superintendent of the Electrolytic Refining & Smelting Co., of Australia, Ltd., and will sail from San Francisco on May 28 for Port Kembla, New South Wales.

C. F. CHASE, sales manager of The Falk Co., Milwaukee, for the past year, has joined the Standard Separator Co., of Milwaukee, as sales manager. Mr. Chase is in charge of both domestic and foreign business and since assuming the new position negotiated two large foreign contracts, one for 25 machines to Buenos Ayres and another for 15 machines to Montivideo. He was for several years with the International Harvester Co. and later with the M. Rumely Co., of LaPorte, Ind., as foreign sales manager.

JAMES J. WALWORTH, formerly superintendent of the Everett Foundry Co., West Everett, Mass., has entered the employ of the Malleable Iron Fitings Co., Branford, Conn., manufacturer of malleable iron, steel and semi-steel castings. The plant of the Everett Foundry Co. was closed in March, 1912.

FLORIAN OGDEN, traffic manager of the Jones & Laughlin Steel Co., Pittsburgh, was the guest of honor and principal speaker at the May meeting of the Louisville, Ky., Transportation Club. Mr. Ogden talked on "The Traffic Department," dealing with the relation of this to other departments of a railroad.

D. B. HANNA, vice president of the Canadian Northern railway, on his return from the Pacific coast, said the shortage of labor which interfered with the Canadian Pacific work, had not seriously affected the Canadian Northern. He expects all branch lines to be connected with the main line before winter.

JOHN W. BODILLY was re-elected president of the Key Kalk Horse Shoe Mfg. Co., Green Bay, Wis., at the recent annual meeting of the stockholders. Frank Bender was re-elected vice president and Gustave Kusterman, secretary and treasurer. Besides the officers, the directors include Paul Dennis, W. L. Evans, Geo. Schober and H. A. Foeller.

T. N. JOHNSON has resigned his position at the Chicago office of the United States Cast Iron Pipe & Foundry Co. to accept a position as general manager of sales at Chicago for the Massillon Iron & Steel Co., succeeding Eliot A. Kebler, who recently resigned that position. Mr. Johnson has had long experience in the pipe business and is well known in the trade.

JOHN HAYS SMITH has resigned his position as commercial engineer of the Milwaukee Electric Railway & Light Co., in charge of engineering and sales, and will engage in consulting engineering practice, with offices in the Merrill building, Milwaukee. Mr. Smith was, at one time, employed with the Duquesne Light Co., Pittsburgh, and was for seven years with the Westinghouse Electric & Mfg. Co.

A. T. ENLOW has resigned as manager of sales of the Stark Rolling Mill Co., Canton, O., to become associated with the Pedler People, Oshawa, Ont. Mr. Enlow has taken an active part in the sheet metal trade of the United States, starting 20 years ago and having been closely connected with various companies ever since. While sales manager of the Stark Rolling Mill Co., Mr. Enlow devoted considerable time to the exploiting of Toncan metal.

NEW BUSINESS

A review of the machinery and machine tool market for the past week shows that the spirit of caution on the part of buyers regarding future business conditions, as they may be affected by the proposed tariff reductions, continues, as evidenced by the numerous reported sales of small lots, and the absence of large orders. Users, apparently, are filling present pressing needs only. The presence of a large number of machine tool builders in New York City last week, in attendance at the convention of the National Machine Tool Builders' Association, centralized the sentiment of the industry in all parts of the country; while there was some diversity of opinion respecting the probable results of tariff reduction on tools, the sentiment as a whole was found to be optimistic.

In New York, machinery sales continue in fair volume. The buying has been of a miscellaneous character, and the railroad and manufacturing interests were about equally prominent. The Lackawanna railroad has followed the intimations given the trade several weeks ago that it would enter the market for shop equipment, with a list of specifications.

In Pittsburgh, machine tool dealers report that a rather large number of inquiries are pending, and several interesting orders have been taken this week. Builders of heavy rolling mill machinery and cranes continue to receive a good volume of inquiries, but there is not the snap in placing orders that there was two months ago.

In Chicago, there are evidences of a revival of activity in machine tool buying and inquiries from old buyers that are spread over a considerable territory. Inquiries calling for one or two tools are still numerous. Few notices of new construction have been received during the past week. No new railroad business has come out, although dealers are expecting to hear from the Rock Island in the comparatively near future. Thus far the Santa Fe has not covered, and the purchases of the Northwestern for the new shops at Clinton, Ia., and at Fortieth street, Chicago, are still pending.

In Cleveland, there has been very little new business in the machine tool trade during the past week. Business generally continued quiet, no inquiries of any size being received by dealers. The city of Cleveland has sent out inquiries for three tools, a shaper, drill and pipe machine. A few boring mills were sold last week. The railroads continue their policy of buying only in small lots, and this class of business has been light for some time.

In Cincinnati, the machinery market is practically unchanged from previous weeks. There are very few new orders being taken, except for single machine tools. Export busines is again on a par with domestic business. Second hand machinery, of which there is rather a large stock on hand, is not selling very satisfactorily. The machine tool business is somewhat bunched, some plants reporting a fair business, and others that they have not received an order for some time. Electrical equipment is selling only fairly well, most of the orders being for the smaller dynamos, motors, etc.

ALABAMA

ALEXANDER CITY.—The city is contemplating improvements to the electric distributing system. J. A. Coley, superintendent.

ALICEVILLE.—The Aliceville Electric Co. is planning to construct an electric light plant. Estimated cost, $8,000.

ATTALLA.—The Alabama Power Co. is planning to purchase the municipal waterworks and spend about $20,000 in improving the system.

BIRMINGHAM.—The Kelley Co. plans the construction of an electric power plant in connection with the 17-mile railway. W. E. Kelley, manager.

BIRMINGHAM. — The Ramsay-McCormack interests plan building a by-product coke plant in the vicinity of Birmingham. Engineers have completed preliminary investigations for the plant.

BIRMINGHAM.—S. Byrd Wheeler, secretary, Daniel Mfg. Co., advises that his company is about to erect a plant for manufacturing brass, copper, bronze, and other metal parts appertaining to its patented appliances, and is in the market for turret lathes, drill presses, motors, brass and bronze small machinery castings, thumb screws, nuts and springs. This company was recently incorporated for $50,000.

GADSDEN.—The Queen City Machinery Co. recently shipped a complete saw mill outfit to the Charles Prater Co., at Wellington, and a car load of machinery to the Rogers Lumber Co., Whitney.

MOBILE.—The Durgam Metal Mfg. Co. and the National Door Check Co. are constructing a plant to manufacture a parented screen door check.

MOBILE.—The Mobile Stove & Machine Co. has recently added to its line of manufacture a small cane mill, for which there is a large demand throughout the state.

MOBILE.—The Gressner & Groh Electric Welding Co., New Orleans, La., is reported to be considering the establishment of an electric welding plant at Mobile, for the repair of steamship boilers and steel plate. F. A. Wilson, business agent of the company has been investigating prospective building sites.

NEW DECATUR.—The Decatur Cornice & Roofing Co., Inc., advises that it has just completed the erection and equipment of a plant for the manufacture of wrought iron building material, such as fire escapes, stairways, wrought iron and wire window guards.

ROANOKE.—A bond issue of $20,000 has been voted for improving and enlarging the electric light and water-works plant.

ARIZONA

PHOENIX.—The American Safety Steel Rail Co. has been incorporated to manufacture and deal in steel railroad rails, hardware, machinery, etc.; $5,000,000; by F. C. Hellstrom, M. J. Hiltner and Frank W. Evans.

ARKANSAS

BOONEVILLE.—Greenway & Harvey are planning the installation of additional electrical machinery in their plant.

DANVILLE.—The Danville Electric Co. is planning the installation of additional machinery.

CALIFORNIA

BAKERSFIELD.—The Standard Oil Co. is building a 32-still oil refinery in the Kern river oil fields near Bakersfield, making eight refineries in this field at the present time.

LOS ANGELES.—The American Iron & Brass Foundry has been incorporated; $26,000; by H. H. Hogue, A. E. Hogue and H. L. Kirsch.

POMONA.—The Pomona Mfg. Co. is in-

creasing the capacity of its foundry and machine shop.

REDDING.—The California, Shasta & Eastern Railroad Co. has been incorporated to build a railroad from Anderson through Bella Vista to Ingot, a distance of 28 miles; $6,000,000; by S. E. Bretherton, F. T. Smith, W. T. Barnett, Paul McCarthy, F. D. Madison, Platt Kent and V. W. Vincent.

SAN FRANCISCO. — Boden's Automatic Hammer Co. has been incorporated; $500,000; by C. S. Boden, H. S. Goold, R. J. Graf, H. F. Morris and H. M. Anthony.

COLORADO

GRAND JUNCTION. — Proposals will be received at the office of O. Wenderoth, supervising architect, treasury department, Washington, D. C., until June 24 for the construction complete, including mechanical appliances, of the United States post office at Grand Junction.

CONNECTICUT

HARTFORD.—Ford, Bush & Sheldon, Inc., 60 Prospect street, have prepared plans for a plant for the Hartford Special Machinery Co. The building will be three stories, 63 x 190 feet, and will be erected at Woodland street and Homestead avenue.

NORWALK.—The Noble & Westbrook Mfg. Co. has been incorporated to manufacture stamping devices and other machinery, with a capital stock of $50,000.

SOUTHINGTON.—The Southington Hardware Co. has recently added some new machinery to its plant.

DELAWARE

WILMINGTON. — The Davis Brake Beam Co., manufacturer of railroad specialties, has started the construction of its new plant at Johnstown, Pa., and will make application shortly for a Pennsylvania charter. The officers are, H. H. Weaver, president; F. J. Lanahan, of the Fort Pitt Malleable Iron Co., vice president; F. R. Weaver, secretary and treasurer.

DISTRICT OF COLUMBIA

WASHINGTON.—The sundry civil appropriation bill, now before Congress, contains an item for an additional building for the Bureau of Standards, the cost not exceeding $45,000. The plans are not yet completed for this building, as the appropriation has not yet become available. The new electrical laboratory of the Bureau of Standards is rapidly approaching completion.

WASHINGTON.—Proposals for furnishing galvanized sheet steel and iron block and galvanized rod steel, pipe, bushings, plugs, couplings, ells, tees, shovels, hammers, bits, drills, dies, reamers, wrenches, files, vises, bibbs, valves, etc., will be received at the office of the general purchasing agent, Isthmian canal commission, until June 5. Blanks and general information relating to these requirements (Circular No. 776) may be obtained from F. C. Boggs, Major, Corp of Engineers, U. S. A., general purchasing agent.

FLORIDA

BARTOW.—Bids will be received until June 2 for the construction of three steel bridges in Polk county. J. A. Johnson, clerk.

JACKSONVILLE.—Recommendations have been made for the installation of additional equipment at the electric light plant.

PALATKA.—Bids will be received until June 3 by the Putnam county board of commissioners for the construction of a bridge on Harlem road. Henry Hutchinson, clerk.

PENSACOLA.—The Georgia Wood Pulp Co. is planning to build a large paper mill in Pensacola. Frederick Kaufmann, president.

SARASOTA.—The Sarasota Ice & Electric Co. has invited bids for furnishing and installing equipment to increase the capacity of its electric light and power plant. R. E. Ludwig, manager.

TARPON SPRINGS.—The Southern Utilities Co. will probably install additional machinery in the plant of the recently purchased Polar Light & Ice Co. H. C. Adams, general manager.

GEORGIA

AMERICUS.—The plant of the Southern Art Metal Co. now practically completed, consists of two buildings, 50 x 150 feet and 40 x 50 feet, while another structure, 50 x 163 feet, will be erected later. Cost about $30,000. The company will engage in the manufacture of sheet metal products.

DALTON.—The Mascot Stove & Mfg. Co. plans to issue $10,000 additional stock and increase the capacity of its plant.

JEWELL.—Bids are invited by the commissioners of Hancock and Warren counties for the construction of a bridge over the Ogeechee river. Address G. C. Bell, Sparta, or G. R. Maner, Warrenton.

MARSHALLVILLE.—J. B. McCrary, Third National Bank building, Atlanta, Ga., has been engaged as engineer to prepare plans for the construction of a municipal electric light system for Marshallville.

MILLEDGEVILLE.—Baldwin county commissioners are making preliminary plans for the construction of a bridge across Little river.

IDAHO

WEISER.—The Western Mfg. Co. has been incorporated to do a general manufacturing business; $25,000; by Earl Pack and T. B. Saylors, Weiser; W. E. Lewis, LaGrande, Ore.; R. J. Cluen and G. A. Tanner, Parma.

ILLINOIS

ALTON.—The new plant of the Alton Steel Co. will probably be ready for operation by the first of October.

CHAMPAIGN.—Kelso & Hill Bros. have added a structural steel department to their plant.

CHICAGO.—The K. & F. Mfg. Co. has been incorporated to manufacture and deal in metal containers; $7,500; address in care of Waldo E. Ferreira, 111 W. Monroe street.

CHICAGO.—The Chicago & Northwestern railway will erect a new machine shop at Fortieth street. The Kenwood Bridge Co. has taken 110 tons of shapes covering the structural steel requirements.

CHICAGO.—A permit has been granted to Cribben & Sexton Co., 644 N. Sacramento boulevard, for the re-building of a portion of the plant destroyed by fire. The erection of a new building to house the plating and polishing departments was begun sometime ago. The latest addition will be of brick, three stories and is a continuation of the main building. It will be used for storage purpose and will cost $23,000.

CHICAGO.—A permit has been granted for the erection of a three-story factory building at 711 W. Chicago avenue for the Devoe & Raynolds, its cost approximately $35,000. Hill & Wotersdorf, 138 La Salle street, architects.

CHICAGO.—The Chicago Belting Co. is taking bids for re-construction work on its factory, 125 N. Green street. The building will be 118 x 143 feet, five stories. L. G. Hallberg, 154 W. Randolph street, architect.

CHICAGO.—The Iroquois Iron Co., 134 S. La Salle street, is erecting a two-story brick laboratory and gate house at the furnaces at 3267 E. Ninety-fifth street. It will be 30 x 48 feet. Chatten & Hammond, 64 W. Van Buren street, architects.

CHICAGO.—H. L. Newhouse, 4830 Prairie avenue, is taking bids for the erection of a five-story warehouse, 30 x 155 feet, for Weil Bros., dealers in plumbing and heating supplies. The building will be located at 653-55 W. Lake street, the firm's present address being 647-51 W. Lake street.

CHICAGO.—M. A. Richardson is erecting a plant for the manufacture of tin ware at 1100 Washington boulevard. The building will cost $30,000, and will be of brick and mill construction, six stories, 20 x 100 feet. Chas. A. Weary, 167 W. Washington street, architect. Bids are being taken.

CHICAGO.—A permit has been granted for the erection of a four-story factory building, to cost $50,000, for C. C. Giles, of J. S. Giles & Sons, manufacturers of tin cases, at 2436 W. Sixteenth street. Present address, 2444 W. Lake street. R. C. Fletcher, architect. Contract for erection let to the Wm. J. Scown Building Co., 36 W. Randolph street.

DECATUR.—The Wabash Locomotive Shops at present under construction, will probably be completed by Sept. 1. The main building of this plant is 160 x 1,200 feet.

DEKALB.—The DeKalb Wagon Co., E. S. Hunt, manager, is erecting a new factory building from private plans, one story, 30 x 230 feet, at an approximate cost of $3,000. S. W. Boardman, 1127 Main street, general contractor.

DUQUOIN.—Sealed proposals will be received at the office of O. Wenderoth, supervising architect, Treasury Department, Washington, D. C., until June 19 for the construction complete, including mechanical appliances of the United States post office at Duquoin.

FARMINGTON.—The Farmington Tool Co. has been incorporated; $25,000; by W. S. Harbert, C. C. Lane and W. L. Phillips.

PERU.—The Brunner Foundry & Machinery Co., which has been manufacturing wagon and railway track scales for 35 years and gasoline engines for 25 years, advises that it has added a pitless scale to its line of manufacture.

ROCKFORD.—The American Foundry Co. is erecting a new building at 707 S. Main street, which will cost $5,000. It will be one story, 65 x 85 feet. E. A. Peterson, 400 Lundberg building, architect, and John MacKee, 1111 Chestnut street, general contractor.

SPRINGFIELD.—The Wilson Vending Machine Co. has been incorporated; $25,000; by Chas. A. Wilson, Harry H. Wilson and A. S. Wilson, all of Springfield.

STERLING.—Sterling and Morrison, Ill., business men have bought the Griswold wire mill here, and plan to start operations.

INDIANA

BOONVILLE.—The Warrick County Coal Co. is being organized with $350,000 capital stock to develop 5,000 acres of coal land by the new stripping method, requiring the use of strippers and equipment which differs considerably from typical coal mining machinery. L. E. Fischer, R. R. Hammond and others are interested.

FT. WAYNE.—Bids are being taken by the county auditor for the erection of a bridge.

GOSHEN.—The city council and county commissioners have asked to rescind their action in appropriating $6,000 for repairs to the bridge over the St. Joseph river, and will be asked to grant another appropriation of $40,000 for the construction of a modern and substantial bridge at this point.

HARTFORD.—Bids will be received until June 2 by the board of Blackford county commissioners for the construction of six new culverts and bridges. James Cronin Jr., county auditor.

INDIANAPOLIS.—The Indianapolis Water Co. has been ordered by the board of works to place water mains covering about 2,450 feet.

INDIANAPOLIS.—The Charles T. Benefiel Co. has been incorporated to manufacture articles of iron, wood, steel, etc.; $15,000; by W. D. Templeton and A. B. Burrell.

INDIANAPOLIS.—The Indianapolis Light & Heat Co. is making preliminary arrangements for the construction of a boiler house at Mill and Nineteenth streets. Estimated cost, $80,000. C. C. Perry, president.

INDIANAPOLIS.—The Oakes Pressed Steel Co., recently incorporated at $50,000, advises that it will manufacture all kinds of pressed steel parts. The officers of the company include W. H. Oakes, president; W. B. Oakes, secretary and treasurer; Carl G. Swenson, general superintendent. Mr. Swenson has been general superintendent of the Worcester Pressed Steel Co., Worcester, Mass., for a number of years. The new company expects to be in its new plant by June 15 and to be able to deliver stampings by the latter part of June.

JASPER.—Bids will be received until May 26 for furnishing power plant apparatus for the municipal light and water plant of Jasper, according to plans and specifications on file with the town clerk, and at the office of the consulting engineer, Paul H. White, Union Trust building, Indianapolis.

LAFAYETTE.—A new bridge over the Wabash river to replace the present flood-damaged Main street structure has been recommended by a committee of engineers appointed by the county commissioners.

MONTICELLO.—A. G. Fisher, auditor of White county, will receive bids until June 3 for two bridges, plans for which are on file.

ROCKPORT.—Bids will be received until June 2 by the board of Spencer county commissioners for the construction of eleven bridges. J. T. Stevenson, county auditor.

SHELBYVILLE.—Bids will be received until June 6 by the board of Shelby county commissioners for the construction of four steel bridges. F. W. Fagel, county auditor.

IOWA

BETTENDORF.—The Bettendorf Co., formerly known as the Bettendorf Axle Co., advises that its capitalization has been increased to $7,500,000. Extensive additions to the equipment of the company's plant are being made, including the installation of three powerful hydraulic presses, several pumps and a considerable line of electrical apparatus and appliances. An additional 25-ton open hearth furnace has been constructed and is now in operation. The plant is running day and night and has orders ahead that will take the remainder of this year to fill.

CEDAR FALLS.—The city engineer is preparing plans for an electric light plant to cost approximately $50,000.

CEDAR FALLS.—The Wagner Mfg. Co. will begin work soon on a new factory building which will cost approximately $12,000. The contract for its erection has been let to F. M. Smith, Waterloo, Ia.

DUBUQUE.—Plans are being considered by local capitalists for the erection of a modern fire-proof hotel to cost $400,000.

DUBUQUE.—Plans are being prepared for the erection of a modern dormitory building for the Wartburg Seminary.

DUBUQUE.—The Dubuque Paper Co. is preparing plans for the construction of a six-story modern fire-proof warehouse.

DUBUQUE.—The city water-works department is preparing to construct a large reservoir on one of the bluffs overlooking the city.

DUBUQUE.—The A. Y. McDonald Mfg. Co. recently moved into its new factory building, erected at a cost of $200,000.

DUBUQUE.—The C., M. & St. Paul Railway Co. is planning to erect a large store and ware rooms and a new depot at the railway shops.

DUBUQUE.—The Iowa Oil Co. will soon award the contract for the construction of a reinforced concrete building, estimated to cost $40,000.

DUBUQUE.—The board of trustees of St. Joseph's College recently awarded a contract for the construction of a reinforced concrete building to cost $300,000.

DUBUQUE.—The Kretschmer Building Co., which recently completed the erection of a reinforced concrete manufacturing establishment, is now building a foundry adjoining, which is estimated to cost $5,000.

MARCUS.—Preliminary arrangements are being made for the construction of an electric light and power plant. Estimated cost $150,000.

SIOUX CITY.—The Electric Engineering Co., 320 Douglas street, will install a modern plating plant at once.

KANSAS

LEAVENWORTH.—The Great Western Stove Foundry suffered damage by fire in its boiler room recently.

PARSONS.—The Missouri, Kansas & Texas Railroad Co. is reported to be preparing to move its car repair shops from Sedalia, Mo., to Parsons.

PLEASENTON.—George Cole, Kansas City, Mo., is opening a foundry at Pleasenton.

SCOTTS CITY.—O. D. Card, city clerk, will receive bids for the construction of an electric light and water works system until 1 p. m., May 27. Plans and specifications are on file with the city clerk and the Alamon Engineering & Supply Co., Omaha, Neb. Construction will include a brick building with tank and tower, a 60-horsepower special electric oil engine, a 35 horsepower electric oil engine, 35 kilowatt generator, 18-kilowatt generator and two deep well pumps.

TOPEKA.—The Valk Mfg. Co., 912 Jefferson street, manufacturer of irrigation machinery and equipment, is increasing the capacity of its plant at a cost of $4,000.

KENTUCKY

AUBURN.—The Auburn Light & Water Co. is promoting a plan for the construction of an electric light plant.

ELIZABETHTOWN.—The Kentucky Utilities Co. has purchased a 50-kilowatt and a 100-kolowatt generator from the General Electric Co. for use at its Elizabethtown plant.

FULTON.—The Fulton Electric Light & Power Co. has increased its capital from $10,000 to $60,000, to provide improvements.

HAZARD.—E. L. Speaks, general manager of the North Fork Coal Co., has announced that equipment will be purchased at once for a new operation to be begun by the company near Hazard.

HENDERSON.—The county of Henderson is to erect 20 bridges of steel and reinforced concrete construction. S. H. Kimmel, county engineer.

HICKMAN.—The Hickman Ice & Power Co. has changed its name to the Hickman Electric Ice & Water Co., and increased its capital from $20,000 to $80,000.

LEXINGTON.—The Louisville & Nashville Railroad Co., with headquarters in Louisville, has acquired a site for the location of its new shops, plans for which have already been drawn.

LOUISVILLE—The Kentark Land & Timber Co., Inter-Southern building, is purchasing equipment for its lumber railroad, which is to be built in Arkansas to develop a large tract of timber land.

LOUISVILLE.—Equipment for the pumping station of the fisheries station here will be purchased by the Commissioner of Fisheries, Washington, D. C., who will open bids June 4.

LOUISVILLE. — The Standard Sanitary Mfg. Co. has been considering plans for the construction of a nine-story reinforced concrete warehouse at Louisville, where one of its principal factories is located. Bids were recently taken and submitted to the Pittsburgh offices, following which it was announced by the company that the building would not be erected for the present, President Theodore Ahrens stating that business conditions are too unsettled to justify the improvement at this time.

LOUISVILLE.—The Louisville Bridge Co., a Pennsylvania subsidiary, is to reconstruct its bridge over the Ohio river at Louisville, Ky. Plans have been submitted to the War Department, but the company has taken the ground that the work to be done is purely reconstruction, consisting of the replacement of the old superstructure, and that therefore the work is not subject to supervision by the department. The latter announced a hearing at Louisville June 18, but the bridge company will not appear at that time, standing on what it believes to be its rights in the case.

PADUCAH.—A pumping station will probably be built by the municipality. If this is done, an additional engine will be installed in the city power house, and dynamos will be purchased for the operation of the pumps.

PAINTSVILLE.—The recently organized Paintsville Water Co. has just secured a site for its pumping station and will begin construction work shortly.

SOMERSET.—Additional equipment will be installed in the powerhouse of the Kentucky Utilities Co. in order to provide day current. C. J. Spragle has been appointed local manager of the company.

LOUISIANA

NEW ORLEANS.—The plant of J. Prados & Son, saw and planing mill, on St. Peter street, was badly damaged by fire recently. The iron foundry of Lewis Schoff, adjoining, was also damaged.

MAINE

PORTLAND.—The Mequier & Jones Co. recently installed a five-ton crane at its plant on Pearl street.

MARYLAND

ELLICOTT CITY.—Bids will probably be opened June 1 for the construction of three bridges in Howard and Montgomery counties.

SPARROWS POINT. — The Riter-Conley Mfg. Co., Pittsburgh, has completed shipment of 700 tons of structural steel for the blast furnace of the Maryland Steel Co.

MASSACHUSETTS

CHICOPEE.—The A. G. Spalding & Brothers Co., manufacturer of sporting goods, is preparing to erect a new factory building. Particulars not available.

FRAMINGHAM.—The T. C. Scruggs Planing Mill was badly damaged by fire recently. The machinery and equipment was valued at $4,000 and the building at $3,500.

HYDE PARK.—The Becker Milling Machine Co. advises that it expects to break ground soon for the erection of a concrete, saw-tooth roof building, which will cover 40,000 square feet and a new brick structure to be used as a hardening and heat treating plant.

NORTH ATTLEBORO.—R. D. Wood & Co., Philadelphia, have received a contract from the water commissioners of North Attleboro for furnishing and delivering 70 tons of 6-inch cast iron water pipe, at $24.50 per ton.

WORCESTER.—Norton Grinding Co. has just completed the manufacture of a 40-inch cylindrical grinding machine, weighing 50 tons, which will be installed in the factory of the National Tube Co., Lorain, O.

MICHIGAN

DETROIT.—Construction work will begin at once on an automobile plant, 170 x 900 feet, for the Paige Detroit Motor Car Co. Plans designed by John Scott & Co. The main building will be 60 x 406 feet, three stories.

DETROIT.—The Ross & Young Machine Co.'s new plant, corner of Jefferson and McDougall avenues, has been completed. The building is of brick and steel construction, 125 x 200 feet, and will be devoted to the manufacture of "Paige 25" for the Page Detroit Motor Car Co.

GRAND RAPIDS.—The control of the Grand Rapids, Holland & Chicago Railroad Co., has been sold to the Commonwealth Power & Light Co. Benjamin H. Hanchett and Charles A. Floyd will continue as president and general manager, respectively.

HANCOCK.—The wire mill at Dollar Bay will double its capacity, according to press reports.

KALAMAZOO.—The Star Brass Co., manufacturer of trolley harps, has started work on a new foundry, 50 x 100 feet.

SAGINAW.—The United States Graphite Co. is having plans prepared for additions at its plant. The plans call for two buildings, a factory building costing $25,000 and an office building costing $16,000.

STOUGHTON.—J. M. Costello plans opening a brass foundry at Stoughton.

MINNESOTA

DULUTH.—The Clyde Iron Works, manufacturer of hoisting machinery, advises that it has not yet completed the details of its plant improvements.

DULUTH.—The Berwind Fuel Co., with executive offices in the People's Gas building, Chicago, advises that it now has in the course of construction large coal handling dock at West Duluth, which will have a soft coal capacity of about 1,000,000 tons, which corresponds to the company's present coal dock at Superior, Wis. The new dock, which is planned to be completed by April 1, 1914, will be equipped with the most up-to-date coal handling machinery, bridges, etc.

EVELETH.—Bids will be received until June 3 for furnishing and installing a 1,000,000-gallon pump, either electric or steam-driven, specifications for which may be obtained of D. P. McIntyre, city clerk.

FAIRMONT.—The Fairmont Machine Co. is adding a 20 x 40 foot addition to its engine testing rooms.

MOORHEAD.—Proposals will be received at the office of O. Wenderoth, supervising architect, treasury department, Washington, D. C., until June 23 for the construction complete, including mechanical appliances, of the United States post office at Moorhead.

ROCHESTER.—Bids have been taken for a power plant, to cost $150,000, at the insane hospital at this place. C. S. Johnson, 750 Capital Bank building, St. Paul, Minn., is architect and the C. L. Pillsbury Co., Metropolitan building, Minneapolis, is engineer.

MISSISSIPPI

VICKSBURG.—Warren county supervisors have authorized the county clerk to advertise for bids for the construction of a steel and concrete bridge over Big Black river.

MISSOURI

ALBANY.—A bond issue of $19,000 has been voted for the improving of the municipal electric light plant. W. E. Noonan, superintendent.

ST. LOUIS.—The Landes Machinery Co. is planning to build an addition to its plant, at an estimated cost of $10,000.

ST. LOUIS.—City Counselor Baird has been instructed to draw up a bill calling a special election on the proposition of issuing $3,500,000 in bonds for the completion of the municipal free bridge over the Mississippi river.

ST. LOUIS.—The Board of Public Improvements of St. Louis has awarded a contract for furnishing the water-works at Chain of Rocks, in the Mississippi river ten miles north of the city, with filter equipment, to the Pittsburgh Filter Co., whose bid was $398,200. Several weeks ago, when bids for the work were received, the Pittsburgh company bid $452,000, which was rejected as too high.

ST. LOUIS.—The Warlick Heater Mfg. Co., St. Louis, has sold to the Federal Lead Co., of Federal, Ill., 77 instantaneous water heaters for use in the lead company's new bath house for its employes. Thirty-two of the heaters are for showers and 45 for washstands, and will be operated by the direct action of steam, dispensing with the usual stand-tank installation. Each unit is independent of the others in supplying hot water.

TRENTON.—The Illinois Steel Co. has been awarded the contract for building four bridges in different parts of Grundy county, by the Grundy county court. Contract price is reported as being $8,992.

MONTANA

GREAT FALLS.—Bids will be received until June 2 for the construction of a bridge over the Missouri river at Ulm. Length 561 feet. Address county commissioners.

MALTA.—Preliminary arrangements are being made for the construction of an electric light plant. Estimated cost, $10,000. R. J. Moore, engineer.

NEBRASKA

BENNINGTON.—The city council has voted in favor of the installation of a water-works system.

EDGAR.—The Edgar Roller Mills, idle for the past three years, has been purchased by G. R. and L. M. Woods. The new owners plan to dispose of the old machinery in order to make way for new equipment.

LINCOLN.—Applications have been filed with E. D. Price, state engineer, for four state aid bridges as follows: One over the Elkhorn in Dodge county, 250 feet long, to cost $14,000; one over the Republican in Furnas county, 300 feet long, to cost $20,000, and two over the Platt, Merrick county, one 825 feet long, to cost $30,000, and one 465 feet long, to cost $19,000.

RULO.—A bond issue of $10,000 has been voted for the construction of a municipal electric light plant.

SILVER CREEK.—An issue of bonds has been voted for the construction of a municipal electric light plant and water-works system.

NEW JERSEY

LINDEN.—The organization of a company to construct a six-mile electric railway, has been completed. Frank R. Anderson, Linden, is a prominent promoter of the enterprise, which will connect the town of Linden with the short line of the Public Service Co.

NEWARK.—The Public Service Electric Co. has filed plans for a large storage and office building, to be erected at 150-156 Canal street and 75-79 River street, to cost $120,000.

NEWARK.—The C. Roberts Rubber Co. will erect a five-story brick addition to its plant at Calden and New streets, estimated to cost $22,000.

NEWARK.—The Ulster Iron Works, Newark, plans building a mill near Bowlbyville. It plans to transfer the puddling mills and rolls from the present plant to the new one and replace them with heating furnaces.

NEWARK.—R. Battelli, architect, 189 Market street, is preparing plans for a two-story addition to the plant of the Hudson Hat Co. The building will be 30 x 35 feet and 45 x 95 feet, and is estimated to cost $15,000.

PATERSON. — The Reynolds-Mason Iron

Co. has been awarded the contract for a bridge at Rived Edge, Bergen county. The contract price was $16,994.

PERTH AMBOY.—The Alembic Process Co., manufacturer of the Gottschalk synthetic rubber process, has located its plant at Perth Amboy, and will be in the market soon for alembics and other necessary rubber machinery.

NEW MEXICO

FORT BAYARD.—The Deming Electric Supply Co., Deming, N. M., has been awarded a contract for furnishing one motor at Fort Bayard and the Malone Electric Co., St. Louis, Mo., will furnish three transformers. (Bids opened April 4. Noted March 27.)

NEW YORK

ALBANY.—The Cohoes Co. has prepared plans for a power house, 67 x 170 feet, to be located below Cohoes Falls. It is planned to install three turbine-units of 10,000 horsepower each. The main offices of the Cohoes Co. are in New York City.

AUBURN.—The United States government building at Auburn is being enlarged, an appropriation of $60,000 having been obtained. Construction work has begun.

BINGHAMTON. — The board of trustees of the Binghampton state hospital are having plans prepared for the installation of a new power plant for the hospital. The state has appropriated $60,000 for the improvement.

BUFFALO.—Fire caused by spontaneous combustion damaged the plant of the Brown Car Wheel works, Howard and Thomas streets.

BUFFALO.—The Stanley Construction Co. has been incorporated to manufacture and deal in sheet iron, copper, tin, etc., $50,000; by E. C. Schlenker, L. S. Bentley and E. L. Marshall, all of Buffalo.

JAMESTOWN.—The Interior Metal Construction Co., Jamestown, has been organized with $80,000 new capital. Fred E. Hatch has been made president; Charles A. Anderson, vice president, and O. M. Otte, secretary-treasurer.

NEW YORK CITY.—The West Side Iron Works, Inc., has been incorporated; $1,000; by Adolph Koenig, 54 East Ninety-eighth street; Jos. Kramer, 2 West Eighty-eighth street, and Chas. S. Gutmann, 509 West 110th street, all of New York City.

NEW YORK CITY.—The I. S. Van Loan Railway Equipment Co., Inc., has been incorporated; engines, machinery, hardware, supplies, etc.; $125,000; by A. C. Case, 242 West Seventy-second street, New York City, Daniel Pierson Jr., East Orange, N. J., and E. W. Samuel, Mt. Carmel, Pa.

NEW YORK CITY.—A sale of second-hand material including motors, boilers, pumps, machine tools, band tools, and scrap iron and steel will be held at the Navy Yard in Brooklyn, June 3. Sealed bids will be received up to June 2, and opened at 10 a. m., the following day.

NEW YORK CITY.—Preston K. Yates, consulting engineer, 30 Church street, is preparing plans for a crushing plant for the Vulcanite Cement Co., of Philadelphia. The plant, which will be erected at once, will be of sufficient capacity to crush the output from all quarries operated by the company. W. R. Dunn, general manager of the Vulcanite company, will supervise the construction work.

NEW YORK CITY.—The Power Specialty Co., 111 Broadway, manufacturer of Foster superheaters and superheated steam specialties, advises that it is building a new erecting shop, 96 x 300 feet. Among recent contracts received for Foster superheaters, are the following: The Public Service Corporation, Burlington, N. J., 3,600 horsepower for installation in Edge Moor boilers; the Rhode Island Co., Providence, R. I., 5,000 horsepower for installation in Bigelow-Hornsby boilers; the Narrangansett Electric Light Co., Providence, R. I., 6,000 horsepower for installation in Babcock & Wilcox boilers; the Havana Electric Railway, Light & Power Co., Havana, Cuba, 14,500 horsepower for installation in Babcock & Wilcox boilers; the J. I. Case Threshing Machine Co., Racine, Wis., 2,000 horsepower for installation in Wickes boilers; the Rochester Railway & Light Co., Rochester, N. Y., 5,250 horsepower for installation in Bigelow-Hornsby boilers and 2,400 horsepower for installation in Babcock & Wilcox boilers; the Moline, Rock Island Mfg. Co., Moline, Ill., 9,000 horsepower for installation in Stirling boilers; the Cleveland Electric Illuminating Co., Cleveland, 20,148 horsepower for installation in Stirling boilers; the Jones & Laughlin Steel Co., Pittsburgh, 3,528 horsepower for installation in Rust boilers; the Brier Hill Steel Co., Youngstown, Ohio, 6,000 horsepower for installation in Erie City boilers.

PORT CHESTER.—The Abendroth Brothers, manufacturers of gas and coal ranges, soil pipe, heaters, furnaces, etc., advise that they have added considerable new equipment in the way of presses, dies, molding machines, etc., and are at present installing a traveling crane with electric magnet for unloading pig and scrap iron. A new pipe cleaning mill is being erected. The firm advises that it expects to open another foundry in Connecticut soon.

SYRACUSE.—The Foster Machine Co. is receiving bids on the construction of a one-story foundry, 37 x 76 feet, which will be erected on South West street.

SYRACUSE.—A. S. Redder, 410 Marcellus street, will erect a one-story foundry in Syracuse. Edward Howard, architect, is receiving bids.

NORTH CAROLINA

LINVILLE FALLS.—The Cranberry Iron & Coal Co. is improving and extending the properties recently taken over from the Linville River Railway Co.

NORTH DAKOTA

BELFIELD.—Preliminary plans are being considered for the construction of a water-works system. Estimated cost, $10,000.

OAKES.—The Oakes Electric Light Co. is contemplating additions to its plant at this place. Frank Kempf, manager. The company will buy a 50 or 75-kilowatt dynamo and a 100-horsepower oil engine.

OHIO

AKRON.—Bridge bids will soon be invited for the construction of a bridge over the Cuyahoga river at north Howard street.

BATAVIA.—The National Lathe Co., Batavia, has been incorporated to manufacture lathes and other machine tools; $10,000; by A. V. Carroll, J. F. Hartman and others.

BARBERTON.—A bond issue of $135,000, $110,000, of which is for a municipal electric lighting plant and $25,000 for improving the municipal water-works system, will be voted upon May 27.

BUCYRUS.—The Columbus, Marion & Bucyrus Interurban line has been sold at receivers' sale to bondholders for $103,000. A new company will be incorporated and the road improved.

CANAL DOVER. — Superintendent James King of the municipal lighting plant has recommended the installation of a large boiler at the water-works station and a turbine at the light plant.

CINCINNATI.—The Acme Machine Tool Co. advises it has installed new machinery and equipment.

CINCINNATI.—The Cincinnati Screw & Tack Co., Cincinnati, has reduced its capital stock from $50,00 to $1,000.

CINCINNATI.—The Cincinnati Foundry Co. has taken out a city building permit for a new foundry to cost $18,000.

CINCINNATI.—E. Greiwe & Bro., of Cincinnati, have been awarded the sheet metal work to be used in the building of the new Factory Power Co.'s plant at Oakley, a suburb of Cincinnati.

CINCINNATI.—Estimates will be received within a month by the Allyn Co., architects, Cincinnati, for the building of the new Miami Hotel in Dayton, O. It will contain 350 rooms, will be 12 stories, of steel construction. It is estimated that about 1,800 tons will be required.

CINCINNATI.—The commissioners of Hamilton county, with headquarters at Cincinnati, have approved an estimate of $90,169 as the cost of the permanent bridge to be built over the Great Miami river at New Baltimore, O. This new bridge will be 465 feet in length with a 25-foot roadway. The superstructure will cost $64,914 and the abutments $25,254.

CINCINNATI—The Ideal Steel Wheel Co., Winton Place, Cincinnati, will add an office building to its plant in the near future. The company also has planned interior changes which include the installation of a forging department and better lockers and sanitary facilities for the workmen. G. R. Hauser, of Cincinnati, is the architect in charge of these additions.

CINCINNATI.—The commissioners of Hamilton, Clermont and Warren counties, at a recent meeting in Cincinnati, agreed on plans and specifications to replace the tri-county bridge at Loveland, O., which was destroyed by the recent flood. The cost will be $22,395, of which Hamilton county will pay 85 per cent, Warren county 5 per cent and Clermont county 10 per cent.

CINCINNATI—G. A. Schacht and William V. Schacht, formerly manufacturers of the Schacht Motor Car, Cincinnati, will re-enter the automobile business, and are at present looking for a factory with the view of purchasing. As soon as one is secured, equipment will be installed and they will begin the manufacture of motor trucks, but may extend the business in the future.

CINCINNATI.—The American Tank, Pump & Oil Co., with principal offices in Cincinnati, is to be reincorporated as the American Tank & Pump Co., with a capital of $50,000. The plant is located at Dayton, O., and the company has branch offices throughout the country. The plant was recently sold to A. C. Davis, of Cincinnati. Tanks, seal measuring, and pumps for oil, gasoline and other liquids will be manufactured.

CINCINNATI.—Estimates for the construction of the 12-story office building that will be erected by the Procter & Gamble Co., at the northwest corner of Eighth and Race streets, Cincinnati, will be received some time before the end of the present month.

The architects in charge are Elzner & Anderson, of Cincinnati. The building will be about 90 feet square, and probably of concrete construction.

CINCINNATI.—An 18-story addition to the Union Trust building, has been provided for by the purchase of a lot 38 x 100 feet adjoining the building, by the Union Savings Bank & Trust Co., its owners. The price paid for the realty was approximately $200,000, and the new addition, which will be 18 stories, and of steel construction, will cost about $300,000. The Union Trust building is 18 stories, is of the steel skeleton type and was the first building of its kind erected in Cincinnati, having been built in 1898. As yet no architects have been assigned to draw up the plans for the improvement.

CLEVELAND.—The erection of the steel for the city's new $2,000,000 light plant, at the foot of East Fifty-third street, will commence about May 31.

CLEVELAND.—Bids will be received until June 10 for furnishing the labor and materials for the construction of an eight-inch water pipe on Yellowstone road, from Mayfield road to Noble road, Cleveland Heights. Plans and specifications on file with H. Canfield, clerk of Cleveland Heights, 309 Beckman building, Cleveland, and with the F. A. Pease Engineering Co., Marshall building, Cleveland.

CLEVELAND.—The Beighlee Electric Co., Inc., 426-30 Columbia building, manufacturer of recording electric instruments, pyrometers, etc., advises that it has received an order from the Steel Improvement Co., Cleveland, for indicating and recording pyrometer equipment to be used in the heat treating department of the plant now being erected by that company. Other recent orders for the installation of Beighlee indicating and recording pyrometer equipment include the Willis-Overland Co., Toledo, the Gramm Motor Car Co., Lima, and the Edward Ford Plate Glass Co., Rossford.

DAYTON.—The Buckeye Iron & Brass Works has received a contract from the Lillington Cotton Oil Co., Lillington, N. C., for a 60-ton oil mill.

DAYTON.—The court has authorized expenditure for the construction of three new bridges. The county commissioners have decided to build a new bridge at Little York to replace the one washed away by the recent floods. The bridge will be 380 feet in length, three spans, and 16 feet wide. Bids will be called for soon.

EAST LIVERPOOL.—The Morgan & Marshall Co-operative Tire & Rubber Co. is planning to build a plant in East Liverpool, 90 x 107 feet.

ELMORE—After operating the waterworks plant here for two and a half years under lease, the city has concluded to purchase the plant from the Elmore Water Co. The price named is $27,000.

ELYRIA.—The city council is reported to be considering the appropriation of $15,000 for the construction of a standpipe in connection with the water works.

FOSTORIA.—The Allen Motor Car Co. has increased its capital stock to $500,000. J. E. Wright, general manager.

FREMONT.—Plans are being prepared for a new bridge in Washington township.

KENTON.—The Champion Iron Co. has closed a contract for the iron work on the new school building at Marion. The contract price is reported to be $40,000.

LEBANON.—Bids will be received until June 9 for the erection of one 150-foot and one 190 foot span high truss steel bridge over the Little Miami river at King's Mills. T. C. Patterson, auditor of Warren county.

LEBANON.—The Oregonia Bridge Co. has been awarded the contract for rebuilding the superstructure of the McConnellsville-Malta bridge across the Muskingum river, to replace the one swept away by the floods March 26. The contract price is $46,000, work to be completed by January 1, 1914.

LEETONIA.—The McKeefrey furnace is scheduled to be blown in this month. The furnace has been absorbed by the Leetonia Steel Co., but will begin operations several months before the new plant of that company is completed.

LIMA.—The Cincinnati, Hamilton & Dayton Railroad Co. is having plans prepared for the enlargement of its shops at Lima, according to reports.

LIMA.—An officer of the Lima Locomotive Corporation, Lima, O., says the new plant of the company will increase the capacity to 1,000 locomotives per year. The plant will be operating after June 1.

LIMA.—The board of control has awarded contracts for furnishing materials and equipment for the new water works plant as follows: The Massillon Iron & Steel Co., Massillon, O., 15,000 feet of 20-inch pipe at $23.40 per ton; the Power Engine Equipment Co., Toledo, O., two boilers, $5,200; the Snow Steam Pump Co., Buffalo, 6,000,000-gallon pumping engine, $15,285; the American Foundry & Construction Co., Pittsburgh, steam heater, $2,260.

LONDON.—Engineers of Franklin and Madison counties are to prepare plans for the Worthington bridge at once.

MARIETTA.—The Kanawaha & Michigan Railway Co. is planning to construct a 50-mile line between Marietta and Middleport.

MT. GILEAD.—Bids will be received until June 6 for the construction of four bridges, according to plans now on file with the county auditor.

MT. VERNON.—The county commissioners will meet on June 2 to consider any protest against the construction of twelve bridges in various parts of this county, the cost of which will exceed $12,000.

NAPOLEON.—Bids will be received until June 6 for the construction of two steel bridges in Henry county. William Stoner, chairman board of commissioners.

NORWALK.—Bids will be received until June 2 for constructing 14 specified bridges in various parts of this county. L. C. Herrick, county engineer, and J. E. Smith, county auditor.

NORWOOD.—An election will be held June 17 for the purpose of voting on a bond issue of $140,000 for proposed extensions to the water-works system.

PIQUA.—The court has granted authority to the city to issue $60,000 in bonds to repair and improve the present water-works system.

PT. CLINTON.—A 75-foot cruiser was successfully launched recently by the Matthews Boat Co. The boat was built for John Brownell, of Dayton, O. So many orders for large cruisers have been received by the local concern recently that it has decided to double its capacity. Work will be begun at an early date.

PORTSMOUTH.—The Portsmouth Engine Co. has been awarded the contract through H. H. Hossman, general contractor, for furnishing castings and machinery for new stoves and furnace repairs for the Bessie Ferro Silicon Co., New Straightsville, Ohio.

SALEM.—The Salem Tool Co. has started an addition to its plant, 40 x 115 feet, one story, estimated to cost $4,000. The addition will be equipped with tool-making machinery and other plant equipment.

TOLEDO.—The commissioners have approved plans for the construction of new bridges to cost $12,450 over Ten Mile creek, and contracts will be awarded June 6.

TOLEDO—Chief Wawatam, the greatest steel car-ferry on fresh water, has arrived at the yards of the Toledo Shipbuilding Co., where it will undergo a general overhauling which will take several weeks.

TOLEDO.—Work is now in progress on the new $2,000,000 concrete dock being built for the Hocking Valley Railroad Co., on the east side of the Maumee river here. Much of the piling is already in position and dredging is also well under way. The work of dredging the channel is being done by the Great Lakes Dredge & Dock Co.

TOLEDO.—The Skeldon Engineering Co. has completed its Garford Automobile Co. contract at Elyria, which amounted to $40,000, and has started work on the municipal waterworks and light plant for the city of Clyde, O., a $35,000 contract. This plant consists of an entirely new installation, including McNaull water tube boilers, Chuse non-releasing Corliss engines, Fort Wayne alternators, waterworks pumps, etc. Among new contracts of this concern are the remodeling of the power plant of the Paragon Refining Co. and building the new refrigerating plant for the Lucas county infirmary.

UPPER SANDUSKY.—Bids will be received until June 10 for the construction of a new county line bridge between Wyandotte and Crawford counties. Peter Frank Jr., auditor of Wyandotte county.

WASHINGTON C. H.—Bids will be received until June 7 for three bridges in Fayette county. A. E. Henkle, county auditor.

YOUNGSTOWN.—A. A. Pauly will build a plant for the government at Colon in the Panama canal zone for the manufacture of hollow building tile. Twelve machines, being made by the Youngstown Engineering Co., will be installed. Approximately 5,000,000 hollow tiles will be used. Mr. Pauly is negotiating with foreign countries for the manufacture of hollow tile.

ZANESVILLE.—Bids will be received until June 7 for the construction of a highway bridge across the Jonathan creek at White Cottage. Address H. H. Kennedy, clerk, board of commissioners, Muskingum county.

ZANESVILLE.—H. H. Kennedy, clerk, board of commissioners, Muskingum county, will open bids June 12 for constructing the superstructure of a bridge across the Muskingum river at Dresden to replace the suspension bridge recently destroyed by the floods. This bridge will be 600 feet long, with a roadway 20 feet in the clear, and must have a carrying capacity of 150 pounds per square foot.

OKLAHOMA

FORT SILL.—Bids will be received until June 2 for furnishing 10-inch cast iron water pipe and the installation of a motor-driven pump at Fort Sill. Address A. V. Falkner, captain of the quartermaster's corps.

McALESTER.—Pittsburgh county commissioners will receive bids until June 9 for the construction of three steel bridges.

OKLAHOMA CITY.—The Cotton Mills Security Co. is endeavoring to complete arrangements to proceed with the construction of its proposed cotton manufacturing plant here. The plans show a plant with 600,000 spindles

and 15,000 looms. W. B. Smith Whaley is interested.

SUPPLY.—The construction of a municipal electric light plant is being considered.

WAKITA.—P. F. Wright and associate have been granted a franchise for the construction of an electric light plant.

OREGON

ASTORIA.—The Pacific Light & Power Co. will extend its light lines to Warrenton, Hammond, Fort Stevens and Clatsop at once. W. H. Galvani, chief engineer.

LA FAYETTE.—A bond issue of $10,000 has been voted for the construction of a municipal electric light plant and waterworks system.

PORTLAND.—The West Coast Construction Co. has been incorporated for $1,000,000.

PENNSYLVANIA

ALTOONA.—M. Poot & Sons, furniture dealers, have purchased a building site from Swift & Co., Union avenue, and plan to erect a building 60 x 120 feet, three stories, of brick and steel construction. Specifications and plans for the building are practically completed, but the contract has not been awarded.

BROWNSVILLE.—W. Harry Brown, Pittsburgh, will develop 1,344 acres of Green county coal. His Alicia coke plant of 400 ovens is operating at capacity.

BROWNSVILLE.—The Reliance Coal & Coke Co., with offices at Pittsburgh, is completing a 400-oven plant at Denbo, Pa. Coke shipments will begin within a fortnight.

BURGETTSTOWN.—The American Zinc & Chemical Co. has been incorporated as a subsidiary to the American Metal Co., Ltd., New York City. As previously announced, the company will build an extensive smelter at this city.

CHAMBERSBURG.—The city council is considering the appropriation of $30,000 for improving the municipal electric light plant, including the installation of new equipment.

CHESTER.—The Chester Gray Iron & Brass Foundry Co., Fifth and Ward streets, organized about two years ago, has reequipped its dismantled gray iron foundry as a brass foundry. R. M. W. Ridington is owner.

CONNELLSVILLE.—The Poland Coke Co. has completed 50 of its 100 ovens and is now shipping some coke.

CORAL.—The mine of the Wharton Coal & Coke Co. is expected to operate shortly, after being put out of commisison by an explosion and fire last September.

EAST MILLSBORO.—The Luzerne Coal & Coke Co. has completed its new plant of 34 ovens which will be fired up shortly.

ELLWOOD CITY.—The Ellwood Foundry is building an addition for offices and pattern storage purposes.

FRANKLIN.—The Franklin Steel Works, a subsidiary company of the Chicago Railway Equipment Co., is reported to be considering improvements to its plant. E. E. Hughes, general manager.

GREENSBURG.—The Greensburg Coal Co. has ordered structural steel head frames and a number of plate steel tanks from the William B. Scaife & Sons Co., Pittsburgh.

GREENSBURG.—The Indian Head Coal & Coke Co., capitalized at $30,000, has been incorporated by the following: J. A. Sheetz and C. S. Pore, Monessen; P. A. Meyers and W. D. Walthour, Greensburg, and J. F. Irwin, Latrobe.

HOBOKEN.—The Hoboken Land Co., a subsidiary of the Blaw Steel Construction Co., has contracted for the erection of 15 frame houses of five, six and seven rooms each. Houses will be built near the plant of the company. The land company has completed 18 houses.

LATROBE.—The Latrobe Tool Co., capitalized at $60,000 has taken out a charter. Incorporators are: M. W. Saxman, Joseph E. Barnett, James T. Hughes, J. H. Shallenberger and W. H. Flickinger, all of Latrobe.

MONESSEN—The Southwork Foundry & Machine Co., Philadelphia, is installing blowing engines, condensing and air pumps and three 3,000-kilowatt generators at the new blast furnaces of the Pittsburgh Steel Co.

OIL CITY.—Additions are being made to the works of the Joseph Reid Gas Engine Co. to meet demands of business. A brass foundry and castings storage building has just been completed, 70 x 140 feet, and addition has been made to the machine shop. Work has been started on a new blacksmith shop, the steel contract being let to the Pittsburgh Bridge & Iron Works, part of the steel being on the ground now. The equipment for these additions has been let.

PARKESBURG.—The Parkesburg Stamping & Mfg. Co. has been incorporated; $100,000; by T. C. Young, J. M. Eshelman, J. H. Kevorkain and T. F. Windle, all of Philadelphia.

PHILADELPHIA.—Estimates are being prepared for bids on a four-story building to be erected at Race and Fairhall streets for William C. Root. Penckert & Wunder, engineers and architects.

PHILADELPHIA.—The Chambers Bros. Co., at Fifty-second and Media streets, manufacturer of machinery, has received a contract from the Sayre & Fischer Brick Co. to completely equip a new plant for a daily output of 150,000 bricks.

PHILADELPHIA.—Brady & Co., 121 North Second street, have purchased a quantity of machinery, including gas furnaces, engine lathes, power presses, etc., during the past week. They will manufacture tinware and will make their own dies.

PITTSBURGH.—The plant of the Pittsburgh Light Castings Co. was damaged by fire recently.

PITTSBURGH.—The Pittsburgh Model Engine Co. has been incorporated; $5,000; by Alexander Black, M. H. England and J. G. Bachman, all of Pittsburgh.

PITTSBURGH.—The American Flexible Bolt Co. has been incorporated; $250,000; by A. A. Bialad, Joseph True and J. H. Bialad, all of Pittsburgh.

PITTSBURGH.—The Crucible Steel Co. of America will build a boiler plant and will install four 600-horsepower boilers. Smokeless stokers of the chain type will be used.

PITTSBURGH.—J. P. Koehler has purchased the former Jelly Foundry property on Smallman street, and will erect a building for a brass and foundry shop.

PITTSBURGH.—The Wayne Brass Foundry Co. has purchased a site on Butler street where it will erect a building for the molding of brass castings.

PITTSBURGH—W. F. Trimble & Sons have placed a contract for steel with the Riter-Conley Mfg. Co. for additions to the Conway, Pa., machine shop of the Pennsylvania Lines West.

PITTSBURGH.—The M'Auley Automatic Trap Co. has taken an order for cast steel traps, to operate at a working pressure of 275 pounds, for installation in the plant of the Portland Gas & Coke Co., Portland, Ore.

PITTSBURGH.—City officials have awarded the contract for the construction of the Haights Run bridge to the Cummings Structural Concrete Co. at the price of $109,480. The bridge will be an ornamental structure.

PITTSBURGH.—The H. J. Heinz Co. has awarded a contract for five 607-horsepower boilers to the Heine Safety Boiler Co., St. Louis. New boilers will be of the two-drum type with two horizontal passes for the gases.

PITTSBURGH.—The Pittsburgh Screw & Bolt Co.'s new plant, near that of the Duff Mfg. Co., is rapidly nearing completion. The building is approximately 400 x 900 feet. The old section of the building formerly was occupied by the Riter-Conley Mfg. Co.

PITTSBURGH. — The McClintic-Marshall Construction Co. advises a recent fire in its power house at Rankin, Pa., was confined to the power house roof and that of the beam shop, adjacent. The loss was about $10,000, with full insurance. The equipment and machinery escaped damage.

PITTSBURGH. — The Southwark Foundry & Machine Co., Philadelphia, with offices in the Frick building, Pittsburgh, has taken an order from the National Tube Co. for two turbo-driven centrifugal pumps of 15,000,000-gallon capacity each. Pumps will be connected to Southwark-Rateau high pressure turbines and driven by Falk gears.

PITTSBURGH.—The West Penn Traction Co. reports rapid progress in the construction of the water power plant of the Hydro Electric Co. near the Cheat River, W. Va. An initial installation of 4,800 horsepower will be ready, Jan. 1, 1914. Ultimate capacity will be 150,000 horsepower. This power development will result in a decrease in the cost of operation of the West Penn properties and may result in cheaper power for iron and steel mills, coal mines, etc., in the Pittsburgh district.

PITTSBURGH.—The George J. Hagan Co., People's Bank building, consulting engineer and contractor in furnace construction, reports the following contracts recently taken:

The Aluminum Co. of America, stoker installations for plant at Messina, N. Y.; the Wheeling Sheet & Tin Plate Co., 10 sheet and 4 box annealing furnaces to be operated by American underfeed stokers, for installation in the new plant at Yorkville, O. This installation is a duplicate of that made for the Washington Tin Plate Co., Washington, Pa.; Prest-o-lite Co., Indianapolis, Ind., manufacturer of high pressure tanks, one double open annealing furnace, stoker-fired; American Steel Foundries, Granite City, Ill., three open annealing furnaces, stoker-fired; Canton Sheet Steel Co., Canton, O., one double box annealing furnace, stoker-fired; Massillon Rolling Mill Co., Massillon, O., two sheet and pair furnaces and three double box annealing furnaces, stoker-fired; Commonwealth Steel Co., Granite City, Ill., eleven stoker-fired core ovens; National Enameling & Stamping Co., Granite City, Ill., 20 sheet and pair furnaces, six sheet mill furnaces and 11 annealing furnaces, all stoker-fired; American Rolling Mill Co., Middletown, O., 71 underfeed stokers to operate sheet and pair furnaces and annealing furnaces.

READING.—The new open-hearth steel department of the Carpenter Steel Co. is expected to be completed July 1. One 15-ton open-hearth steel furnace is being installed and provision has been made for another furnace of similar capacity and one of 50-ton capacity. The output will be used for the manu-

facture of high grade steel for tools. The Forter-Miller Engineering Co., Hartje building, Pittsburgh, is in charge.

STOYESTOWN.—Directors of the United Light, Heat & Power Co. plan to erect an addition to their plant and install a new boiler engine and generator.

WASHINGTON.—The Barnes Safe & Lock Co., Pittsburgh, will award contracts next week for four buildings to be erected at this city, where the company will operate a modern plant.

YORK.—The Variety Iron Works, North Beaver and North streets, York, is making shipments for the architectural and ornamental iron work for the new pier, building at Atlantic City, N. J.

YORK.—The Standard Chain Co., Pittsburgh, has rebuilt the Schmidt works, destroyed by fire some time ago, and the new plant is now operating at capacity. It is considerably larger than the former mill.

SOUTH DAKOTA

CARTER.—The town board has plans prepared for the installation of a new waterworks system at an estimated cost of $9,500. The work will include a steel tank. Contracts will be awarded May 27. A. R. Martin, town clerk.

TENNESSEE

BUTLER.—A hydro-electric plant is to be built and equipped by Walker Bros., who have employed D. R. Shearer, of Knoxville, Tenn., as engineer.

DAYTON.—A knitting mill will probably be erected by C. Y. Haggard, who has been organizing a company with that end in view. The probable capitalization is $25,000.

MEMPHIS.—The Virginia Bridge & Iron Co., Roanoke, Va., is constructing an addition to its erecting shop at Memphis, and will install a 20-ton and a 10-ton crane in the receiving yard.

MEMPHIS.—The bridge to be constructed across the Mississippi river at Memphis by the Arkansas & Memphis Railway Bridge & Terminal Co., is being designed by Modjeska & Angier, Chicago. Provision will be made for two railroad tracks, roadway and electric railway tracks. Estimated cost, $600,000. C. A. Morse, Chicago, chief engineer. The estimated cost of yards development is $1,200,000.

MONTEREY.—An electric light plant will be established by T. E. Goff, J. T. Price and others, a franchise having just been secured from the municipality.

NASHVILLE.—The Nashville Machine Co. has contracted to furnish the city light department with a 900-kilowat and a 15,000-kilowatt turbine.

NORFOLK.—The Norfolk City Gas Co. has awarded contracts to the Richmond Construction Co., Norfolk, to erect a machine shop, 60 x 140 feet.

TEXAS

BERCLAIR.—The Farmers' Gin Co. will increase its capacity by the addition of new machinery. Cyrus Lucas, owner.

CLEBURNE.—The Gulf, Colorado & Santa Fe Railway Co. is making improvements at Cleburne, which will cost approximately $175,000. The additions include a wood-working shop, 76 x 352 feet, a frame wheel shop, three transfer tables and a large amount of machinery and shop tools.

COOPER.—A stock company is being formed for the purpose of installing a water-works system in Cooper. Estimated cost, $50,000. R. J. Thomas is interested.

ORANGE.—The Orange Iron Works, manufacturer of logging cars, etc., is installing a new cupola.

RUSK.—The new Norman & Lewis foundry now is operating.

SAN ANTONIO.—The Alamo Iron Works, founder and machinist, advises that it has increased the size of its foundry and added a Hawley furnace for quick repair work. Some tools have recently been added to the equipment of the machine shop and a bulldozer and twisting machine for handling concrete rods installed in the structural department.

WEST.—The Southern Traction Co., Dallas, has purchased the local electric light plant and is considering improvements.

UTAH

SALT LAKE CITY.—The Morby Automatic Switch & Patent Co. has been incorporated; $1,000,000; by Geo. Morby, president; W. P. Betts, treasurer; James H. Rudd, secretary; Albert Morby.

VERMONT

ESSEX JUNCTION.—A bond issue of $10,000 has been voted for improvements to the water-works system.

VIRGINIA

RADIO.—Sealed proposals will be received at the Bureau of Yards and Docks, Navy Department, Washington, D. C., until June 14, for furnishing and installing three electric hoists at the United States Naval Radio station, Radio.

RICHMOND.—The Richmond Structural Steel Co., Inc., has increased its capital stock from $75,000 to $100,000.

WASHINGTON

ARLINGTON.—Bids will be called soon for sewer system for this city to cost $20,000.

CENTRALIA. — Articles of incorporation have been filed by Charles and James Gilchrist, C. R. Stahl and W. W. Dickson for Wabash Lumber & Shingle Co.; $100,000.

CHEHALIS.—The board of county commissioners will build a new steel bridge across the Chehalis river with 220-foot span.

MONTESANO.—Bridges will be built across the Wynoochee and Black rivers at this place.

PORT ANGELES.—The city engineer has been authorized to secure estimates for the cost of the construction of an electric light plant.

SEATTLE.—Heffernan Engine Works has the contract for repairing Steamer Admiral Sampson at a cost of $18,000.

SEATTLE.—The city will build a steel bridge across East waterway at a cost of $612,000. A. H. Dimock, city engineer.

SEATTLE.—J. M. Bruce & Co. was awarded the contract for building the bridge on West Wheeler street at $206,422.

SEATTLE.—The board of public works has awarded contract for two hook and ladder gasoline trucks and one aerial tower to Gorham Fire Apparatus Co., total cost, $22,000.

SPOKANE.—Bids will be received soon by J. R. Holman, chief engineer of the O. W. R. & N., for union passenger station for O. W. R. & N. and C. M. & St. P.

SPOKANE.—The Grauman-Walker Printing Co., established less than three years ago, whose plant is rapidly nearing completion, will expend approximately $30,000 on new equipment, automatic machinery being a feature. The new plant is being constructed at Ide avenue and Monroe street.

TACOMA.—The Hofius Steel & Equipment Co., Seattle, will establish a branch house in this city to handle logging supplies. A warehouse to cost $20,000 will be built.

TACOMA.—President Louis D. Pratt, of the National Realty Co., National Realty building, has announced plans for a 16-story hotel, class A construction, to cost $600,000. New structure will have 240 rooms, all with bath and all outside outlook. Heath & Gove, National Realty building, architects.

WEST VIRGINIA

HUNTINGTON.—A bond issue for $150,000 has been proposed for the construction of a municipal light and water plant.

WHEELING.—The Wheeling Electric Co. is planning to erect a 165-foot steel tower on the river bank on Forty-first street, on which a high-tension cable will be supported across the river to Ohio. A tower of similar type, 135 feet high, will be built on the Ohio shore.

WHEELING.—The Wheeling Mold & Foundry Co. advises that the improvements to its plant, consisting of a new roll shop, 60 x 120 feet, and a new crane runway and pattern storage building over the stock yard, 50 x 300 feet, as previously noted in THE IRON TRADE REVIEW, are about completed and will go into operation within a few days. The crane runway and pattern storage building is to be equipped with a 20-ton crane of 55-foot span for handling all material for the furnaces and foundry. The new roll shop was constructed in order to separate the roll work from the general machine shop work, and also to make room for necessary new machines in the machine shop. The company now has under way the installation of a 30-ton crane in its 600-foot runway, over the casting storage yard, and a new annealing furnace similar to the one now in operation. New machines installed within the past few weeks include a Bullard vertical turret lathe and a large gear hobbing machine. H. S. Bradley is secretary of the Wheeling Mold & Foundry Co.

WISCONSIN

BRILLION.—The Brillion Iron Works, manufacturer of crushers and gasoline engines, advises that it is planning to build an addtion to its foundry, 60 x 120 feet, which will double the capacity of that department. The new addition will be constructed of steel and concrete and will be equipped with overhead trolleys and overhead pouring system, tracks, cranes, and molding machines. The company is also planning to build an addition to its warehouse.

CLEAR LAKE.—The Clear Lake Canning Co. will enlarge its plant by the erection of a 24-foot addition to the main building and the installation of new machinery.

LA CROSSE.—The La Crosse Gas & Elec-

tric Co. will spend approximately $150,000 in improvements during the coming summer. The contemplated plans call for a structure of brick, concrete and steel, 33 x 135 feet.

MANITOWOC.—The Wisconsin Aluminum Foundry Co. awarded the contract for the construction of its new foundry plant at Manitowoc to Georgenson & Schneider, of Manitowoc, at $22,400. The equipment will cost an additional $15,000, inquiry for which is now being made. This work has previously been noted in THE IRON TRADE REVIEW.

MILWAUKEE.—The Crucible Steel Castings Co., 612 Clinton street, advises that it is installing a Snyder electric furnace, which will probably be placed in operation by June 1.

MILWAUKEE.—The Brodesser Mfg. Co., capital $20,000, has been incorporated by Peter H. Brodesser, Roman Brodesser and Harry Soulen, to manufacture elevators, friction clutches, power lawn mowers, meat choppers, rolling mill machinery, etc. The company has been engaged in business for some time in the former plant of the Brodesser Elevator Co., Weil and Burleigh streets. Three years ago the Brodessers sold out their majority interest and the Brodesser Elevator Co. moved to Winnepeg, Manitoba, Can., where extensive operations were maintained. On May 1, 1913, the Canadian plant was closed and the Brodessers organized a new company to operate in Milwaukee, but on a more extensive scale than in Canada. During the last four years the Brodesser interests have also been identified with the motor truck industry, which is now known as the Juno Motor Truck Co., of Juneau, Wis., the Brodesser interest having been disposed of in 1911.

MONROE.—The Invincible Metal Furniture Co. has been organized by local business men to engage in the manufacture of metal furniture in the large factory erected by the Commercial Club for the use of a metal-working concern which has since ceased operations. The new company is capitalized at $20,000, and the incorporators are I. M. Stauffacher, A. L. Noel and Chas. E. Miller. Immediate equipment requirements are cared for by the machinery already in the plant.

SUPERIOR.—The Lehigh Valley coal dock at Superior will be rebuilt this year at a cost of approximately $1,000,000, according to Superintendent E. L. Emmert. The improvements will include a new anthracite shed, of steel and brick construction, on a concrete foundation, new shipping plant of 6,000 tons daily capacity, as compared with 2,500 tons at present. The docks will be devoted exclusively to the handling of anthracite.

WAUKESHA.—The Spring City Foundry Co. has been organized at Waukesha with a capital stock of $10,000 to conduct an iron foundry in a part of the former Wisconsin Central car and locomotive shops at Waukesha. Casper Reichl, Albert Icke and Gustav Schmidt, all of Milwaukee, are the promoters of the enterprise. A large part of the Central shops is already occupied by the Werra Aluminum Co., founded recently by Conrad Werra and Alex Pankratz, formerly of the Manitowoc (Wis.) plant of the Aluminum Castings Co.

WYOMING

CHEYENNE.—The Glendale Power Co. has been incorporated to do a general business in electrical and hydro-electrical power; by P. S. Bruckner and J. R. Monroe, both of Cheyenne.

DOMINION OF CANADA

ALBERTA

CALGARY.—The citizens have passed by-laws for raising $527,660 for trunk sewers, $250,000 for street railway equipment and extensions and $70,000 for extending the conduit system.

EDMONTON.—Edmonton will construct a cleansing and purification plant for its sewer system at an estimated cost of $30,000.

EDMONTON.—W. H. Allen, Son & Co., of Bedford, Eng., have been awarded the contract for supplying an 18,000,000-gallon low lift pump.

BRITISH COLUMBIA

EDMONDS.—A sawmill will be erected here at a cost of $85,000, provided the company is exempted from taxation for ten years. The offer is being made to the city council through Messrs. Ladner and Cantelo, solicitors, Vancouver. The plant would have a capacity of 100,000 feet a day.

KAMLOOPS.—Tenders will be received by the city clerk, J. J. Carment, up to June 12 for the supply of water wheels, generators, exciters, transformers and switching equipment for the proposed new hydro-electric plant.

LYTTON.—The British Columbia department of public works is inviting tenders for the complete structure of a concrete arch across the North Thompson river at Lytton, B. C., also a steel bridge to be erected alongside the present structure.

VANCOUVER.—The contract for furnishing 300 fire hydrants has been awarded to Robertson-Godnow Co. for $39.25 and $69 each, according to kind.

VICTORIA.—The Brackman-Ker Milling Co., Ltd., has entered into an agreement with the Western Canada Flour Mills whereby their interests will be merged and will build several large elevators for handling the increased grain.

VICTORIA.—The city council has applied to the railway commission to have the E. & N. Railway Co. construct a steel span girder bridge over Hereward road, to take the place of the present trestle bridge.

MANITOBA

BRANDON.—A by-law will be submitted by Brandon, to raise a debenture loan of $200,000, for water-works extensions at a cost of $80,000, and pumping station, $5,000; pumping station equipment, $50,000; new pump, $20,000; sedimentation basin, filter beds, etc., $80,000.

WINNIPEG.—The Canadian Steel Pipe Co., of Winnipeg, has been awarded the contract for supplying the city of Minneapolis with 10,000 feet of 48-inch lock bar steel pipe.

WINNIPEG.—The board of control is contemplating a gas testing station at a cost of $3,205. Three testing and four pressure recording stations have been recommended by the commissioner of public utilities. M. Peterson is secretary of the board of control.

ONTARIO

BERLIN.—The citizens on May 16 adopted a by-law to raise $30,000 for the extension of the street railway system.

BRANTFORD.—Plans are now being made by the Lake Erie & Northern railway to locate shops in the outskirts of the city.

BRANTFORD.—H. B. Rowell, of the Brantford Autocycles, Ltd., is one of the chief shareholders in the Brantford Machine & Foundries, Ltd., a company recently incorporated, which contemplates constructing a plant here for the manufacture of tools for which there is a big demand in this country. The new machine shop will cover an area of 10,000 square feet, the buildings being of one-story construction. They will include a foundry.

FORT WILLIAM. — Fort William claims that it will soon have a huge steel plant. Sir William MacKenzie, of the Canadian Northern railway, has announced that financial negotiations are progressing for the erection of a plant between Fort William and Port Arthur. Over a mile of water frontage has been set aside for the undertaking, the cost of which is understood to be in the neighborhood of $5,000,000.

FORT WILLIAM.—Among new industries to be established in Fort William this year are the Canadian Car & Foundry Co., which will build a large plant for the manufacture of coaches and freight cars; a plant for the manufacture of starch and glucose, to be built by A. M. Nanton and associates, costing about $400,000; a plant on which the National Tube Co. has already begun operations to cost $400,000, and a $100,000 wire manufacturing plant to be erected by the Great West Wire Fence Co.

GALT.—The water commissioners announced that $70,000 is required for the extension of the water-works system, and a by-law to raise that amount will be submitted to the citizens.

GALT.—Work is going ahead on the construction of the new Galt Shoe Co.'s plant. P. H. Secord & Sons, Ltd., Galt, contractors. The motive power to be used will be hydro-electric, and the building will be heated by steam.

HAMILTON. — The Gartshore-Thomas Pipe & Foundry Co., of Stuart street, is building a $5,000 addition to its plant. The Hamilton Bridge Works Co. has the contract for the iron and steel.

LINDSAY.—The Canadian Boving Mfg. Co., manufacturer of hydraulic and other machinery, has been granted a bonus of $10,000 by the town.

OTTAWA.—Letters patent have been issued authorizing the increase in capital stock of the Maritime Nail Co., Ltd., from $250,000 to $3,250,000.

OTTAWA.—Tenders will be received by the department of public works for the construction of a dry dock at Lauzon, Que., on the St. Lawrence river. R. C. Desrochers, secretary to the department.

OTTAWA.—Tenders for the construction of the new Welland canal will be called by the department of railways and canals within a month's time. This will be an immense work, involving millions of dollars.

OTTAWA.—The mines branch of the department of mines has established at Ottawa a modern laboratory for purposes of experi-

mental concentration and metallurgical tests with Canadian ores and minerals including the use of cobalt as an alloy with steel.

OTTAWA.—The completion of the Canadian Northern railway's line east to Port Arthur, Ont., which will be completed this fall, will require 40,000 tons of steel rails. Five steel bridges have been constructed. Most of the steel rails are being purchased from the Algoma Steel Co., of Sault Ste Marie.

OTTAWA. — Official announcement was made in the house of commons last week by the minister of trade and commerce that a series of internal grain elevators would be built in western Canada, as well as transfer elevators on the Pacific coast and one at the terminus of the Hudson bay line.

PORT ARTHUR. — It is reported that Messrs. Davidson and Smith will build a flour mill in Port Arthur with a capacity of 2,500 barrels per day, also grain elevators in Port Arthur and Coquitlam, B. C., each elevator to cost $650,000.

LONDON.—The London Pressed Brick & Tile Co., Ltd., capitalized at $100,000, which has acquired clay deposits on the outskirts for the production of pressed brick, has closed contracts with the Berg Machinery Co., of Toronto, for the installation of machinery early in July. The plant will have a capacity of 22,000 bricks daily.

TORONTO.—The Canada Foundry Co. has been awarded a contract for the 16-inch cast iron pipe for the East Toronto sewer outlet.

TORONTO.—The city has signed the contract with Scott & Law for the construction of the St. Clair avenue bridge, after deciding to call for new tenders, an idea later abandoned.

TORONTO.—The city has decided to engage an expert to conduct the valuation of the Toronto Railway Co. and the Toronto Electric Light Co., which the city proposes to purchase.

TORONTO.—Tenders will be called shortly by the Dominion government for extensive harbor improvement works at Toronto to be carried out by the public works department. This will include the building of a dock, revetment walls, dredging and other operations. The estimated cost this year will be around $6,000,000, but will later amount to $20,000,000. The work will commence some time in July.

TORONTO.—The Perolin Co. of Canada, Ltd., has been incorporated to manufacture and deal in machinery, appliances, etc.; $50,000; by Francis Henry Stewart, Wilbert Willis, Howard Anderson, and others, of Toronto.

TORONTO.—The Canada Foundry Co. has received the contract for supplying the structural steel for the new Loew theater to be built on Victoria street. Norcross Bros., of Worcester, Mass., have received the general contract for the construction of the new technical school at a cost of $1,082,700.

TRENTON.—The plant of the Bar Register Co., maker of cash registers, was destroyed by fire May 11. In the same fire the plant of the Miller & Co. canning factory was also consumed, the total loss, which is covered by insurance, being $100,000.

WELLAND.—The John Deere Plow Co. will erect a large plant here this summer in conjunction with the firm's plant at Dain, near here.

QUEBEC

BEDFORD.—The town will build a waterworks system, and will first engage the services of an engineer to report on the matter.

MONTREAL. — The Cook Co., Sudbury, Ont., has been awarded the $3,000,000 contract for enlarging the main of Montreal reservoir.

MONTREAL.—The Fred Thomson Co. has been incorporated to carry on a business in electrical machinery; $100,000; by F. J. Laverty, C. A. Hale, J. Dunlop and others, of Montreal.

MONTREAL.—The firm of Escher, Wyss & Co., of Zurich, Switzerland, has been awarded the contract for supplying two additional 13,000-horsepower double Francis turbines to the Western Power Co., Ltd. The Canadian General Electric Co., Ltd., received the contract for two additional generators of corresponding capacity and the Canadian

MONTREAL.—The Toronto Paper Co. is planning for extensive improvements to its plant at Cornwall, Ont., which will increase capacity over 100 per cent. New turbines will be installed, bleaching apparatus and equipment for making loft-dried writing paper.

PLESSISVILLE.—The Plessisville Foundry Co.'s plant was destroyed by fire on the 16th inst., entailing a loss of $150,000, with insurance of $60,000.

SHERBROOKE. — The Sherbrooke Flexible Steel Ladder Co. has been incorporated at Sherbrooke with $5,000 capital by T. T. Delisle, M. A. Laine, J. Charest and others.

WATERLOO.—The Central Vermont Railway Co. has commenced to rebuild its railway shops which were destroyed by fire last fall.

SASKATCHEWAN

REGINA.—Plans have been prepared for an engine and boiler house at a cost of $6,000, for the Regina Brewing Co.

REGINA.—A power house and laundry at a cost of $10,000 are planned by the city council. It will be of structural steel, reinforced concrete and brick construction. M. R. Darrack, Western Trust building, is the architect.

SASKATOON.—The Saskatchewan Mfg. Co., a farm machinery concern, will erect several large buildings in Saskatoon. The company will be capitalized at $200,000, and its president will be S. Houghton, of Crookston, Minn. (Previously noted.)

SWIFT CURRENT.—Babcock & Wilcox have been given the contract for supplying three 300-horsepower water tube boilers; Goldie & McCulloch, of Galt, Ont., one 300 and one 500 high-speed reciprocating steam engine; Allis-Chalmers-Bullock, of Winnipeg, one 200 and one 400-kilowatt alternating current generator, for the city's steam power plant.

TRADE NOTES

ATTICA, IND.—Officers of the old Attica Bridge Co., Attica, advise that their company's name has been changed to East St. Louis Bridge Co., and that plant and offices have been moved to East St. Louis, Ill.

CHICAGO.—The International Molding Machine Co. is moving from 2300 South Western avenue to 2614 West Sixteenth street. Increased business made the change necessary.

CHICAGO—Burton W. Mudge & Co., dealers in railroad specialties, have changed their name to Mudge & Co., and moved their offices from the People's Gas building to 439-47 Railway Exchange building.

CHICAGO.—Joseph T. Ryerson & Son have moved their Chicago city office from 1734 Commercial National Bank building to 235 Railway Exchange building. Austin M. Mueller remains in charge.

CINCINNATI.—The Manufacturers' Permanent Exhibition Co., recently incorporated with a capital of $700,000, is planning to erect a five-story building on the site of the Burnett House. This building will be given over to the exhibition of products manufactured in the Cincinnati district. James P. Orr, E. W. Edwards and L. W. Smith are among the directors of this company.

HARTFORD, CONN.—The American Automatic Press Co., a California concern, has filed suit against the Taylor & Fenn Co., Hartford, charging infringement of patents.

LANCASTER, PA.—Bayard T. Brandt has been appointed receiver for the Lancaster Foundry Co.

LANSDALE, PA.—The Central Radiator Co. has completed a new line of radiator patterns, constructed along scientific lines, which are giving excellent satisfaction.

MT. VERNON, O.—The Chapman Engineering Co., Mt. Vernon, O., reports considerable activity in the gas producer field. Among the recent sales of its standard 10-foot producers are six for the Forged Steel Wheel Co., Butler, Pa.; two for the Railway Steel Spring Co., Inter Ocean Works, Chicago Heights Ill.; one for the Carnegie Steel Co., Mingo Works, Mingo Junction, O.; two for the Nova Scotia Steel & Coal Co., Sydney Mines, Nova Scotia. The Bethlehem Steel Co., South Bethlehem, Pa., ordered six Chapman producers last year for open-hearth work and after a thorough trial have just placed a repeat order for six.

NEWARK, N. J.—The city council will try to make the Crucible Steel Co. take up tracks it has laid across unused streets. Officers of the company told councilmen they would make an offer for the purchase of the streets.

NEW YORK CITY.—Retiring directors of the Pennsylvania Steel Co. were re-elected in the annual meeting of stockholders.

NEW YORK CITY.—Kieley & Mueller, 34 W. Thirteenth street, manufacturers of valves, water regulators, pump governors, steam traps, etc., advise that their recent incorporation was merely to transfer a firm into a corporation and involves no important changes in the business.

PITTSBURGH, PA.—The American Bridge Co. has resumed operations on the erection of the superstructure of the new bridge to connect the Point with the North Side. High water and cold weather interrupted the work this winter.

SAN ANTONIO, TEX.—The Alamo Iron Works, founder and machinist, advises that its volume of business during 1912 was 25 per cent in advance that of 1911.

SPENCER, N. C.—E. H. Darling, former assistant engineer of the Hamilton Bridge Works, Hamilton, has become a member of the firm of McPhie, Kelly & Darling, architects and engineers, Toronto.

TOLEDO, O.—The Baker-Vawter Co., manufacturer of loose leaf systems and steel vertical filing sections, has removed its offices to 452 Ohio building.